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ABSTRACT

The effectiveness of the first 5 years of tech prep in New York was examined through a three-component evaluation. Data were obtained from three sources. First, statewide surveys and interviews obtained input from 717 teachers, counselors, and administrators and 987 students currently involved in tech prep programs in New York's 30 tech prep consortia and an additional 132 tech prep professionals and 79 students and 15 local decision makers from outside the educational system. Second, a pairs study compared the performance of 1,050 tech prep students representing 15 consortia and 804 non-tech prep students. Third, a study of best practices in tech prep programs in 28 consortia was conducted. Most program participants found tech prep beneficial to students' academic, career, and social development and to staff, schools, and the community. Compared to their non-tech prep counterparts, tech prep students earn higher grades, have better school attendance, and have higher high school graduation rates and scores on New York's Regents Competency Tests. (Sixty tables are included. Appendixes constituting approximately two-thirds of this document contain information about the following: survey and interview methodologies and respondents; pairs study coding forms and instructions; study regression models; and descriptions of 97 best practices.) (MN)

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ED 412 355

EVALUATION OF TECH-PREP IN NEW YORK STATE

FINAL REPORT

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This document is part of a series of reports of a Statewide Evaluation Study of the first 5 years of the Tech-Prep Program in New York State. The series includes the following reports:

EVALUATION OF TECH-PREP IN NEW YORK STATE
FINAL REPORT [1]

EVALUATION OF TECH-PREP IN NEW YORK STATE
CONDENSED FINAL REPORT [2]

EVALUATION OF TECH-PREP IN NEW YORK STATE
FINAL REPORT – EXECUTIVE SUMMARY [1,2]

EXEMPLARY PRACTICES IN TECH-PREP
IN NEW YORK STATE [2]

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STATEWIDE SURVEYS AND INTERVIEWS
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[3] **Evaluation Consortium, University at Albany, SUNY, 1400 Washington Avenue, Albany, NY 12222; 518-442-5018 or FAX 518-442-4953.**

EVALUATION OF TECH-PREP IN NEW YORK STATE

FINAL REPORT

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COMMENTARY

The three components of this evaluation study have revealed the richness and diversity of the Tech-Prep programs across New York State. The multiple study, multiple measures research strategy reported on in this document presents a broad array of evidence that Tech-Prep is a highly visible program that has across-the-board affects on many constituencies. It is clear that many students experienced positive attitudinal and motivational changes as an outgrowth of a program that is academically rigorous, includes applied instruction and has built-in college transfer opportunities. Tech-Prep appears to be especially beneficial to students who initially had no plans to continue their education beyond high school.

The Surveys and Interviews component of the study has uncovered a wealth of positive feedback from the variety of stakeholders and, perhaps most important, from local decision-makers who viewed Tech-Prep from external vantage points. These data also indicated that many teachers have benefitted professionally from their involvement with Tech-Prep. Quotes from individual interviewees elicited in this component lend a human quality to the program impact.

The Pairs Study that compared a matched sample of Tech-Prep and non-Tech-Prep students at the secondary and post-secondary levels showed statistical significance of several important outcome variables. However, these findings and the research design employed need further study in smaller research projects dedicated to single or a few selected sites where greater control can be exercised over sample selection and the Tech-Prep intervention itself.

One of the most promising trends that warrants further study is the affect that Tech-Prep high school participation has on post-secondary performance. We plan to focus attention on that issue in a follow-up study. In addition, as increased numbers of associate degree graduates who have participated in Tech-Prep appear across the State, we plan to explore their occupational and educational patterns.

The Best Practices Study shows that innovation in education still exists and appears to thrive in the Tech-Prep atmosphere where non-traditional behavior is welcomed. The large number and variety of descriptions of individual practices that were received indicates a substantial range of creative problem-solving and a universal willingness to share programmatic successes with others.

Future legislation will undoubtedly focus more weight on performance outcomes for Tech-Prep. It is clear that the diverse criteria used to identify Tech-Prep students need to be revised such that a student so identified would receive a substantial part of the Tech-Prep program at a well-defined minimum.

In summary, the authors believe that the outcomes shown here recommend the Tech-Prep model as an important educational reform which should become an integral part of secondary and post-secondary educational offerings.

EVALUATION OF TECH-PREP IN NEW YORK STATE

FINAL REPORT

EXECUTIVE SUMMARY

The Tech-Prep program, initiated in the Vocational and Applied Technology Education Act of 1990, requires a cooperative effort between secondary and post-secondary institutions. Tech-Prep involves joint faculty development of applied and integrated academic and technical instruction encompassing the 11th and 12th grades through an associate degree, or equivalent, in a career field. Staff development and student support activities are also specified in the enabling legislation.

In New York State, there are 30 Tech-Prep consortia geographically distributed including rural, urban and suburban populations. A consortium may include many central school districts or high schools, area vocational-technical centers (called BOCES for Board of Cooperative Educational Services), two-year colleges, senior colleges, and many local businesses and industries, or it may be as small as a single high school, one college and several businesses.

This study covers the first five years of Tech-Prep in the State of New York to the beginning of the Fall 1996 semester. There are three major components to the evaluation.

1. State-wide Surveys and Interviews involving all 30 Tech-Prep consortia, conducted by the Evaluation Consortium at the University at Albany, SUNY,
2. The Pairs Study; a study of Tech-Prep student performance in a sample of 15 high school-college paired institutions compared with non-Tech-Prep students from the same years and classes at the high school, and
3. The Best Practices Study; descriptions of 97 "best practices" in Tech-Prep programs from 28 of the 30 State consortia. The Pairs and Best Practices studies were conducted by the Center for Advanced Study in Education (CASE) of the City University of New York (CUNY) Graduate School.

State-wide Surveys & Interviews

This part of the evaluation explored the structure of Tech-Prep, recruitment of students and their transition to college, program and curriculum development, support mechanisms, outcomes, areas needing improvement, and other elements, all of which are reported in detail in the full report.

Survey responses were received from 717 professionals and 987 students currently involved in Tech-Prep programs. In addition, 132 Tech-Prep professionals and 79 students were interviewed, as were 15 local decision-makers from outside the educational system. All references made below refer to the cohort sampled in this study.

Some of the key findings are given below.

Demographics:

- Over 12,000 students are currently enrolled in secondary Tech-Prep programs. Of those for whom information was available, 64% are white, 19% Black, 12% Hispanic, 4% Asian or Pacific Islander, and 1% Native American; 53% are female, 7% have limited English ability, 6% have special needs, and 37% are economically or educationally disadvantaged. Individual consortia vary widely from these averages.
- Students are enrolled in business-office-marketing clusters (34%), engineering technology (27%), mechanical-industrial trades (12%), and human-health sciences (10%).

Program Descriptions:

- Program participants describe Tech-Prep as a "hands-on" program that combines academic and vocational experiences by developing skills for the workplace, providing career direction and focus, and making a connection between what is taught and the real world.
- Administrators and guidance counselors see the program as a means of serving at-risk students, providing a bridge between high school and post-secondary education, and as a quality option to the Regents track[1].
- Local decision-makers see the program as a way of creating a better work force, assisting at-risk students, and creating higher standards.

Program Involvement:

- About half of the high school guidance counselors -- but few of the college admissions counselors -- had been involved in program development. Those that had been involved were knowledgeable about program goals and were active in recruiting. Those not involved were not aware of the unique college bound aspect of the program.
- The majority of high school teachers had not been involved in the development of the program but were now involved in designing or updating the curriculum.
- One-third of the post-secondary faculty actually taught what they considered to be a Tech-Prep course. College faculty did, however, spend time working with high school faculty concerning curriculum content.
- More than one-quarter of the teachers, administrators, and guidance counselors reported that they had conducted training for peers or local staff on Tech-Prep.

Program Perceptions & Outcomes:

The majority of program participants believe that Tech-Prep is beneficial, contributes to the academic, career, and social growth of the students while providing benefits to the staff, the school, and the community. Here are some of the specific areas mentioned.

[1] The Regents "track" is a college preparatory curriculum which requires students to pass a number of Regents exams in specific subjects in order to receive a Regents diploma. Students who don't qualify for the Regents diploma may earn a local diploma which has different criteria

- The majority of students agree that the classes are interesting, are preparing them to get a good job, cover the materials they need to know, have improved their thinking skills and have increased their motivation for learning.
- Over 90% of the staff agree that Tech-Prep is beneficial for former general track students, helps orient students to current work-place requirements, and helps retain students who might have been at-risk.
- Local decision-makers support the program in that it effectively prepares students for post-secondary education and future employment, that students have more marketable skills and are more employable, that students are better prepared for college, and that students have more self-esteem and increased motivation for work.
- In addition, local decision-makers believe that students who may not normally have gone to college are now doing so and the program is continuing to raise standards.
- High school teachers believe they are now better instructors because of the additional training and opportunities to enhance their knowledge provided by the program including the opportunity to have more contact with businesses.
- Teachers also indicated that they gained new knowledge that was important in and of itself, including new skills in math, science, and technology that not only enriched their classrooms but also their daily lives.
- Both high school and college teachers have improved their relationships and ability to communicate with students and other educators. College faculty indicated that they now have more contact with students and high school teachers, while high school teachers have closer relationships with students and with other teachers in common core instructional areas.
- Secondary and post-secondary administrators indicated that the program enhanced relationships with local businesses, that high schools and colleges had better relationships, and that high schools had better relationships with other secondary schools.

Barriers to Program Development & Areas Needing Improvement:

Program participants were asked to identify possible barriers to future development of Tech-Prep and areas in need of improvement. Here are some of these barriers and needs for improvement.

- There is a fear of program elimination, an indicated need for continuous funding in order to preserve the unique features of the program, and a desire for the program to be institutionalized without change.
- Administrators and teachers indicated that implementation of Tech-Prep as a new program required additional resources in time, faculty training, curriculum development, supplies, equipment, and staff development. This need for additional resources continues beyond the initial start-up to maintain high quality and continue staff development on new technology, new career paths, and to integrate new faculty and counselors into the program.
- High school teachers feared that the program might become a substitute track for at-risk students thereby threatening the college preparation aspects of the program.
- Teachers and students reported that some guidance counselors treated Tech-Prep students as non-college-bound, which contributed to incorrect advisement of new students, inaccurate information about the courses in the program, and miscommunication to parents about the program.
- Some secondary and post-secondary participants perceived a need to increase business and community involvement in the program; business involvement is particularly important in possible

sharing of resources. Also, methods need to be developed to assist rural and non-industrial area consortia to identify and include local businesses.

- Both secondary and college respondents were concerned about the State requirement for Regents courses and exams and the potential threat to the implementation and integration of Tech-Prep.

The Pairs Study

The Pairs Study was designed to explore what contribution Tech-Prep makes to students high school and college performance and to discover how Tech-Prep and non-Tech-Prep students compare on a variety of academic indices.

A "pair" consists of one high school and one college which receives graduates from that high school in the same Tech-Prep consortium. There were 6 rural pairs, 6 urban pairs and 3 suburban pairs, totaling 15 in the sample representing 15 different consortia. Transcripts for high school Tech-Prep students from program inception through the 1995-1996 academic year were gathered and a comparison group of non-Tech-Prep students from the same years and classes was formed and matched by gender and an early academic measure. The matched sample was further equated through statistical procedures. A total of 1,050 Tech-Prep students and 804 non-Tech-Prep students were represented in this study.

A wide range of variables were examined for both student groups. Variables included demographic information, high school information, high school standardized tests, and college information.

After controlling for 9th and 10th grade academic scores, analyses revealed that participation in Tech-Prep was positively related to high school and college performance. Several results in which there were statistically significant differences include the following:

- In the 11th and 12th grades Tech-Prep students attained higher grade averages than their non-Tech-Prep peers.
- Tech-Prep students were absent from high school fewer times than their non-Tech-Prep peers.
- Tech-Prep students were more likely than non-Tech-Prep students to pass the mathematics and science Regents Competency Tests.
- Tech-Prep students were more likely than their peers to graduate from high school within four years.
- Overall, Tech-Prep students were just as likely as their non-Tech-Prep peers to graduate from high school with a Regents diploma. However, in urban areas a greater proportion of Tech-Prep students received Regents diplomas.
- Among students graduating with local diplomas, Tech-Prep students performed better than their peers in their first and second years of college.
- Among students graduating with Regents diplomas, Tech-Prep students achieved lower first year college GPA's than their non-Tech-Prep peers. However, by the end of the second year of college these Tech-Prep students obtained GPA's that were higher than those of their non-Tech-Prep peers.

The Best Practices Study

The 97 one-page descriptions of "Best Practices" in Tech-Prep programs in New York State have been assembled to permit interested parties to consider replicating all or part of any of these practices, all of which are in operation and have had useful impacts. The descriptions include contact numbers of Tech-Prep personnel who are directly involved with these practices and who will welcome inquiries for further information about their practices.

Titles of the 97 practices are given in The Best Practices section of the full report to shorten the search time for those with specific target areas of interest. The Best Practices section of this report has also been published as a separate document. The practices have been classified into four general categories for convenience, but these are not mutually exclusive. The four categories are:

- Those with a primary focus on Students (34 Practices)
- Those of immediate interest to secondary and post-secondary Faculty (28 Practices)
- Those of direct application to Administrative matters (8 Practices)
- Those which are Combinations of the other three categories (27 Practices)
    - 14 are Combinations of Students & Faculty categories
    - 3 are Combinations of Students & Administrative categories
    - 4 are Combinations of Faculty & Administrative categories
    - 6 are Combinations of all the other three categories.

Postscript

This evaluation design used a three-part investigation of the New York State Tech-Prep Program after five years of operation. Each of these three components revealed a variety of positive outcomes. It is apparent that the professionals involved in the program and the students gave enthusiastic support to Tech-Prep in their surveys and interviews as did local decision-makers who were not directly involved in Tech-Prep. The comparison of student groups in the Pairs Study produced a number of positive and statistically significant outcomes. However, as increased numbers attend the paired colleges, further research on the relative performance of the two student groups would be appropriate. Additional research is also indicated to determine the extent to which Tech-Prep associate degree graduates find suitable employment, continue their higher education, or both. The Best Practices Study was an effort to share some of the innovative practices in these programs with a broader community.

EVALUATION OF TECH-PREP IN NEW YORK STATE

FINAL REPORT

INTRODUCTION & BACKGROUND

In 1985, Dale Parnell's The Neglected Majority, focussed attention on the middle 50 percent of high school students who do not prepare for or pursue a bachelor's degree and leave high school unprepared for the modern workforce. He proposed integrating the 11th through 14th years in occupationally-oriented technical curricula which blended the liberal and practical arts and provided for smooth transition to upward mobile jobs.

As the Carl D. Perkins Vocational Education Act (VEA) was being considered for reauthorization, a bill presented by William Ford of Michigan entitled Tech-Prep was made part of the new Carl D. Perkins Vocational & Applied Technology Act of 1990 (VATEA). This was the first major federal initiative promoting comprehensive linkages between high schools and two-year colleges.

VATEA defines Tech-Prep as a combined secondary and post-secondary program that:

- Leads to a two-year associate degree or a two-year certificate or equivalent registered apprenticeship completion.
- Provides technical preparation in a field of engineering technology, applied science, industrial or practical art or trade, agriculture, health, or business.
- Builds student competence in applied academics of mathematics, science, communication and technology through a sequential course of study.
- Leads to placement in employment.
- Provides for joint training and orientation of secondary and post-secondary faculty and similar joint training for counselors.

In the 1995-1996 academic year in New York State fourteen Tech-Prep inter-institutional partnerships or consortia, which were funded under VATEA, were in their fifth funding cycle and fourteen more were in their fourth year of funding. Two additional consortia which were begun in 1993-1994 were in their third year, giving a total of 30 Tech-Prep consortia geographically distributed across the state. A consortium consists of at least one college offering associate degree career programs and at least one to as many as thirty secondary schools which send graduates to that consortium college. Most consortia were begun with one-year planning grants followed by more substantial implementation funding. In addition to the Tech-Prep consortia, two Tech-Prep Technical Assistance Centers have been created to help coordinate the work of the consortia, provide timely information and referrals, assist in organizing conferences and workshops for staff development, arrange for periodic networking meetings of the consortia directors and coordinators, provide a clearinghouse for national, regional and locally developed published materials, and generally serve as responsive resources for the consortia personnel. The State Education Department has a cohesive arrangement between its secondary and post-secondary elements which oversees the entire Tech-Prep VATEA effort.

By the end of June 1996, most of these consortia had begun graduating high school Tech-Prep program students, although relatively few students had completed associate degrees since community college students often require more than two years to complete a degree. This extra time may be due to required remedial courses, lighter course-credit loads to accommodate family and employment responsibilities, repeating courses to improve grades, unavailability of sequential courses when needed, change of curriculum major, engaging in cooperative education work study programs, or combinations of these effects.

During the Spring of 1996, the State Education Department asked the two Tech-Prep Technical Assistance Centers to jointly plan and conduct an evaluation of the program from its inception through the beginning of the Fall 1996 semester, a period of just over five years.

EVALUATION DESIGN

The state-wide evaluation of the Tech-Prep program was designed to include comprehensive input from the major stakeholders -- students, faculty, counselors, and administrators -- as well as studying the absolute and relative academic performance of Tech-Prep students. Information about local relationships with business, industry, labor and community groups was included in surveys, on-site visits and interviews with individuals and groups of stakeholders. In addition, the evaluation solicited descriptions of best practices from the thirty consortia.

Tech-Prep student performance was determined from a sample of pairs of institutions in three sub-groups of consortia; rural, suburban, and urban. A minimum of five consortia per sub-group were planned for by starting with seven in each sub-group and anticipating some declinations and shifts between sub-groups. A pair consisted of a secondary school with a Tech-Prep program and a college in the same consortium which received graduates from that high school. The school records of all the Tech-Prep students who began the program since its inception in that high school were gathered, examined and compared with a similar group of non-Tech-Prep students from the same high school classes and years. Each non-Tech-Prep group was at least half as large as the Tech-Prep group and matched with equivalent proportions by gender and one significant academic average or score. In addition, group differences were equated statistically. The college records of those from both groups who enrolled in the paired college were also studied and compared.

A letter from the New York State Education Department over the signatures of two Deputy Commissioners, one from the Office of Elementary, Middle, Secondary and Continuing Education and the other from the Office of Higher and Professional Education, addressed to the appropriate school and college administrators greatly facilitated the work of gathering records and arranging for on-campus evaluation activities.

The Evaluation Consortium in collaboration with the Two-Year College Development Center (TYCDC), both located at the University at Albany, State University of New York (SUNY) had the responsibility for developing the surveys and interview protocols, arranging for on-site visits at each

of the thirty consortia, and implementing the surveys and visits. These activities were carried out under the direction of Dr. Dianna L. Newman, Associate Director of the Evaluation Consortium. Dr. Newman and her colleagues were also responsible for analyzing and reporting the results of these efforts to John M. Fabozzi, Director of the TYCDC.

The Tech-Prep Technical Assistance Center at the Center for Advanced Study in Education (CASE) of the City University of New York (CUNY) Graduate School was responsible for initiating the gathering of descriptions of best practices from the thirty Tech-Prep consortia as well as designing the Pairs Study of student performance. Dr. Stanley M. Brodsky, P.E., Coordinator of the Tech-Prep Technical Assistance Center at CASE, directed those elements of the evaluation. The Pairs Study data were analyzed statistically, interpreted and reported by Dr. Carmen Arroyo with technical assistance provided by Dr. David Rindskopf. The Director of the Technical Assistance Center at the Two-Year College Development Center at the University at Albany, SUNY, John M. Fabozzi, assisted in the analysis of the best practices submissions.

STATE-WIDE SURVEYS AND INTERVIEWS

Introduction:

In 1996, the New York State Department of Education mandated an evaluation of the state-wide Tech-Prep program. One of the three studies which were commissioned was this state-wide summary of efforts on behalf of Tech-Prep including a general description of students, curriculum practices, and stakeholder perceptions. This section of the evaluation report addresses the state-wide study of Tech-Prep by surveys and interviews.

Multiple evaluation questions were addressed as part of this evaluation. These included:

A description of who is served by the program and the curriculum offerings, answered by:

- **Evaluation Question One: What Constitutes New York State Tech-Prep?**

A summary of the delivery of New York State Tech-Prep, answered under:

- **Evaluation Question Two: How Are Students Recruited Into Tech-Prep And What Is The General Status Of Their Transition To Post-Secondary Institutions?**
- **Evaluation Question Three: How Is Tech-Prep Implemented In Terms Of: a) Designing And Developing Tech-Prep Programs; b) Designing And Presenting Tech-Prep Curriculum; And c) Developing And Sharing A Professional Tech-Prep Knowledge Base?**
- **Evaluation Question Four: What Support Mechanisms Are In Place For Tech-Prep staff?**

Perceptions of program outcomes and barriers to reaching those outcomes were addressed under two additional questions:

- **Evaluation Question Five: What Are The Perceived Outcomes Of Tech-Prep?**
- **Evaluation Question Six: What Are The Perceived Barriers To Implementing Tech-Prep And What Areas Are In Need Of Improvement?**

Methodology

Information pertaining to the state-wide evaluation of Tech-Prep was collected using both quantitative and qualitative methodologies. Data were collected using: (1) paper and pencil surveys of stakeholders distributed to each of the 30 Tech-Prep consortia; and (2) interviews and focus groups conducted, according to a stratified sampling plan, at each of the 30 Tech-Prep consortium sites. Stakeholders from whom data were collected are as follows: consortium directors; high school students, students with special needs, teachers, guidance counselors and administrators; and post-secondary students, faculty, administrators, and admission staff.

Surveys:

Paper-pencil survey instruments were developed by the Evaluation Consortium in consultation with regional directors of Tech-Prep. Four instruments were developed for the high school component including surveys for: students, teachers, administrators, and guidance counselors. A modified version of the student survey was developed for students with special needs. Four surveys were developed for post-secondary stakeholders including: students, faculty, administrators, and career counselors and admissions staff. A more comprehensive survey was developed for the consortium director. Each consortium director was provided with copies of the surveys and was requested to obtain a representative sample of data. In Table S-1 a summary of the respondents providing survey information is presented. See Appendix S-A for a copy of the surveys, the sampling plan for survey instruments, the breakdown of consortia responses, and a detailed description of survey respondents.

Interviews:

Each Tech-Prep consortium was visited by one or more members of the Evaluation Consortium between October 1996 and February 1997. The purpose of these visits was to collect qualitative data that would provide additional information supporting and adding to the survey responses. Interview protocols were developed by the Evaluation Consortium in consultation with regional directors of Tech-Prep. A stratified sampling plan was developed such that data representative of all stakeholder groups would be collected across multiple sites; within each site the consortium director and four different types of stakeholders were selected for interviews. Students were interviewed using a focus group format; other stakeholders were interviewed either individually or as cohort groups. Telephone interviews were held with 15 local decision-makers (community members, business representatives, and school board members) identified by consortium directors. Presented in Table S-1 are the number of interviews conducted. Appendix S-B presents the interview protocol and the breakdown of stakeholder interviews conducted in each consortium.

TABLE S-1

BREAKDOWN OF RESPONDENTS TO THE SURVEY & INTERVIEW PROCESS

Stakeholder	Survey	Interview
Consortia Directors	23	30
High School Teachers	296	50
High School Teachers (Special Needs)	79	2
High School Administrators	70	15
High School Guidance Counselors	73	30
High School Students	865	10[a]
High School Students (Special Needs)	65	6
Post-Secondary Faculty	110	11
Post-Secondary Administrators	40	16
Post-Secondary Counselors & Admissions	26	8
Post-Secondary Students	57	1[a]
Local Decision-Makers		15[b]

a = focus groups with 6-10 students
b = telephone interviews

Evaluation Question One: What Constitutes New York State Tech-Prep?

The purpose of Evaluation Question One was to describe the current status of New York State Tech-Prep, including the number and types of students served, the make up of the consortia, and the types of offerings provided by the consortia. Both survey and interview data were used to answer this question. A paper-pencil survey was distributed to each of the 30 consortium directors requesting a summary of their consortia. Interviews were also conducted with the different stakeholders to elicit generalized perceptions.

The quantitative data presented below is based on the 23 surveys that were returned from consortia directors. Total numbers are based on frequencies summed across the respondents, and average numbers are used to portray a "typical" consortium. Qualitative data are based on interviews with the 30 directors.

Students in Tech-Prep:

The number of students who were reported to be in Tech-Prep in grades 9, 10, 11, and 12 is shown in Table S-2. These numbers are based on data provided by 21 of the 30 consortia. Although grades 11 and 12 have the largest number of students, there are growing numbers of students in grades 9 and 10 that will be moving into the upper grades in the next two years.

TABLE S-2

STUDENT DISTRIBUTION IN GRADES 9 TO 12

	9th grade	10th grade	11th grade	12th grade
Total Number Reported	2400	2501	3705	3425
Mean Number	114	119	176	163

A breakdown of student involvement by ethnic background is presented in Table S-3. On the average, approximately 64% of the students in Tech-Prep are White; 19% are Black; 12% are Hispanic; 4% are Asia-Pacific Islanders; and 1% is Native American. The minimum and maximum percentages represent the consortia with the greatest and smallest percentage of students within each group respectively.

TABLE S-3

STUDENT DISTRIBUTION BY ETHNIC BACKGROUND -- PERCENT

Percent (%)	White	Black	Hispanic	Native American	Asia Pacific Islander	Unknown
Average	64	19	12	1	4	10
Maximum	99	84	49	8	19	100
Minimum	3	0	0	0	0	0

The distribution of students by specific background is presented in Table S-4. The gender balance of Tech-Prep students is nearly equal. On average 7% of Tech-Prep students have limited skills in English; however, there is a consortium where half of the students use English as a Second Language (ESL). The average percentage of students with a diagnosed disability is 6% although the rate reached a maximum of 23% in one consortium. On average 37% of students are economically or educationally disadvantaged with one consortium indicating that 80% of its Tech-Prep students are in this category. Again, minimum and maximum percentages represent the consortia with the greatest and smallest percentage of students within each group.

TABLE S-4

STUDENT DISTRIBUTION BY SPECIFIC BACKGROUND -- PERCENT

Percent (%)	Female	With Limited English	With Disabilities	Economically/ Educationally Disadvantage
Average	53	7	6	37
Maximum	87	50	23	80
Minimum	30	0	0	2

Data related to the distribution of students by career cluster are presented in Table S-5. Business/ Office/Marketing and Engineering Technology are the two most common career clusters in which students are involved.

Transfer data available on post-secondary institutions are reported in Table S-6 for the years 1993 to 1996. It should be noted in using this table, that many of the consortia are only now beginning to develop tracking mechanisms for students; hence, the data presented are representative only.

Description of the Consortia:

Summarized in Table S-7 are data pertaining to the make-up of the consortium by type of institution. Most consortia included both local area school districts and community/technical colleges as members of their Tech-Prep consortia. Area vocational-technical centers (called BOCES in New York State for Board of Cooperative Educational Services), employers/businesses and associations were other common members in consortia (74% and 65%, respectively). The last category also included a range of state and local government agencies, labor union representatives, and community groups.

TABLE S-5

STUDENT DISTRIBUTION BY CAREER CLUSTER -- PERCENT

Career Cluster	Percent (%)
Business/Office/Marketing	34
Engineering Technology	27
Mechanical/Industrial Trade	12
Health/Human Services	10
Arts/Humanities	5
Agriculture	3
Other	8

TABLE S-6

TECH-PREP STUDENTS IN POST-SECONDARY INSTITUTIONS 1993-1996
NUMBER OF STUDENTS REPORTED BY CONSORTIA

Type of Post-Secondary Instit	1993	1994	1995	1996	Total
Community/Technical College	67	276	517	674	1534
Four-year Colleges/Universities	57	213	266	403	939
Proprietary/Post-Sec Schools	5	8	40	20	73
Registered Apprenticeships	0	0	0	0	0
Armed Forces	1	31	39	161	232
Other	4	3	41	53	101
Graduated Post-Sec Progrs	0	0	0	0	0
Employed In Related Jobs After High School	41	86	172	232	531
Total	175	617	1075	1543	3410

The percentage of Tech-Prep consortia by type of structure are presented in Table S-8. Most (83%) had 2, 3 or more years of high school and 2 years of college. Approximately half (48%) of the consortia had options for further study in an articulated program at 2-year post-secondary institutions or a technical center; approximately half (48%) had options for further study at 4-year post-secondary institutions.

TABLE S-7

CONSORTIUM MEMBERS – PERCENT

Institutions	Percent (%)
Local Area School Districts	96
Community/Technical Colleges	96
Area Vo-Tech Centers (BOCES)	74
Employers & Business Associations	65
Four-Year Colleges	43
Labor Groups	30
Post-Secondary Proprietary Institutions	26
Other Agencies	39

TABLE S-8

CONSORTIA MODEL STRUCTURES – PERCENT

Type Of Structure	Percent (%)
2 Years of High School + 2 Years of College	22
3 or More Years of High School + 2 Years of College	22
2 Years of High School + 2 Years of College & Options for Further Study in Articulated Program at 4-Year Post-Sec Institution	17
3 or More Years of High School + 2 Years of College & Options for Further Study in Articulated Program at 4-Year Post-Sec Inst	22
1 or More Years of Junior High/Middle School + 4 Years of High School + 2 Years of College	4
1 or More Years of Junior High/Middle School + 4 Years of High School + 2 Years of College & Options for Further Study in Articulated Program at 4-Year Post-Sec Institution	9
Other	4

The percentage of consortia which reported defined career clusters and course articulation for each program category is presented in Table S-9. Eighty-seven percent (87%) had defined career clusters; 13% did not. Of those who did, 85% had a Business/Office/Marketing career cluster, 70% had Engineering Technology, and 65% had Health/Human Services. The Mechanical/Industrial Trade career cluster was present in 30% and Arts/Humanities in 15%. The frequency of course articulation in Tech-Prep was similar to that of the defined career clusters: Engineering Technology, Business/Office/Marketing, and Health/Human Services were the three most common, respectively.

Seventy-four percent of consortia had a consortium-wide core program. Common elements of consortia-wide core programs were:

- Taking applied academic course (83%);
- Taking academic or occupational courses related to career cluster (78%);
- Workplace experiences (78%); and,
- Career development activities (72%).

TABLE S-9

CAREER CLUSTERS AND COURSE ARTICULATION -- PERCENT

Program Category	Defined Career Clusters (%)	Course Articulation (%)
Business/Office/Marketing	85	77
Engineering Technology	70	82
Health/Human Services	65	64
Mechanical/Industrial Trade	30	32
Agriculture	20	18
Arts/Humanities	15	14
Other	15	18

Description of Tech-Prep:

As part of the interview process, high school teachers, administrators, guidance counselors and post-secondary faculty, administrators, and admissions staff were asked how they would describe Tech-Prep to a peer. Analysis of their responses yielded common themes: Tech-Prep is a hands-on/applied program, it acts as a bridge between academics and vocational coursework, it has a seamless (continuous) curriculum, and it is a way of preparing students for post-secondary education. A breakdown of themes by stakeholder group is presented below.

High school teachers' description of Tech-Prep focused on three themes: the way Tech-Prep is taught, the curriculum that is covered, and Tech-Prep as a means of providing transition to post-secondary education.

- In terms of the way Tech-Prep is taught, most faculty described Tech-Prep as "*hands-on*", a "*practical application, providing real world experience*" and "*active*". For teachers, Tech-Prep is a means of combining academic and vocational experiences by developing skills for the workplace, providing career direction and focus, and making a connection between what is taught and the real world.
- Tech-Prep teachers also emphasized the importance of the curriculum, indicating that it is different than what they teach in non-Tech-Prep classes. Teachers stated they put more emphasis on integrating technology into the classroom, they have more freedom to design the curriculum, they give the students more freedom to learn in ways that best meet the students' needs, and they present a more interdisciplinary and cooperative learning framework.
- Another important descriptor of Tech-Prep, according to secondary teachers, is its role in preparing students to attend post-secondary education. They believe Tech-Prep assists in the process by: providing more math and science skills, eliminating the need for remediation at the post-secondary level, providing students with advanced standing at post-secondary institutions, and creating collaboration between high school and post-secondary institutions.

High school administrators saw Tech-Prep as:

- A means of providing hands-on, application to the real world where math, science, and technology are integrated.
- A partnership between high school and post-secondary institutions.
- Quality options to the Regents track, a means of upgrading the standards for non-Regents students, and a means of providing additional support for at-risk students.

High school guidance counselors viewed Tech-Prep as:

- A bridge between high school and post-secondary education.
- A link between academics and technology, thereby providing a focus on careers.
- A way of providing at-risk students with higher self-esteem.
- A way of teaching and encouraging teamwork.
- Beneficial for English as a Second Language (ESL) students.

Post-secondary faculty described Tech-Prep as:

- A means of providing a seamless, continuous curriculum.
- A hands-on approach to learning new technologies that involve more math and science.
- A bridge to post-secondary education.
- A means of increasing students' critical thinking and problem-solving skills.

Post-secondary administrators described Tech-Prep as:

- A seamless curriculum provided by articulation agreements between high school and post-secondary institutions.
- A more applied approach to teaching and learning.
- A means of preparing students for post-secondary education.

Post-secondary admissions and career counselors perceived Tech-Prep as:

- A seamless curriculum from high school to post-secondary.
- A means of reducing the stress of transfer to college for at-risk students.

Evaluation Question Two: How Are Students Recruited Into Tech-Prep And What Is The Status Of Their Transition To Post-Secondary Institutions?

The second evaluation question addressed the following: (1) how are students identified and advised to participate in Tech-Prep; and, (2) the status of their transition from high school to post-secondary settings. Data for this section were collected through: (1) paper and pencil surveys for high school students, including those with special needs and post-secondary students; (2) interviews with high school guidance counselors, post-secondary administrators and admission staff; and, (3) focus group interviews with high school students.

Identification & Advisement:

Students were asked to indicate who advised them to enroll in Tech-Prep (Table S-10) , sources of career information (Table S-11), and why they chose to enroll in Tech-Prep (Table S-12). Data in Table S-10 show that guidance counselors were the key source of advisement for all students, followed by parents/caregivers and teachers. No major differences were found between high school students and high school students with special needs. Post-secondary students received advice mostly from college counselors and teachers.

Students also were asked to indicate how much advisement on career assistance they received from various teachers, counselors, or parents (Table S-11). Important findings include:

- Approximately one-third of all three types of students responded that they received a great deal of assistance/information from at least one teacher, counselor or parent/caregiver,
- Approximately one-fifth of high school students with special needs indicated that they received little or no assistance/information from teachers, counselors, or parents/caregivers, and
- Tech-Prep students now at the post-secondary level indicated that they received the most assistance from teachers and guidance counselors.

TABLE S-10

SOURCE OF ADVISEMENT TO ENROLL IN TECH-PREP-- PERCENT

Source	HS Students	HS Special Needs	P-S Students
Parents/Caregivers	45	40	25
Teachers	41	45	47
Peers	25	29	22
Administrators	5	5	17
Guidance Counselors	70	74	58
Others	9	6	5

HS = High School; P-S = Post-secondary

TABLE S-11

ASSISTANCE/INFORMATION FROM TEACHERS, COUNSELORS, & PARENTS/CAREGIVERS -- PERCENT

Source	HS Students	HS Special Needs	P-S Students
A Great Deal From At Least One Teacher	33	35	40
A Great Deal From At Least One Counselor	31	22	39
A Great Deal From Parents/Caregivers	36	37	22
Some From Teachers	34	27	35
Some From Counselors	36	34	27
Some From Parents/Caregivers	28	40	18
Little or None From Teachers	13	23	8
Little or None From Counselors	14	24	12
Little or None From Parents/Caregivers	9	17	10

Students then were asked why, based on this advisement, they decided to enter the Tech-Prep program (Table S-12). A variety of responses were provided:

- High school students enrolled because they were "interested in the program" (22%), because *"it was good for their career choice"* (17%), or it *"gave them a chance to learn"* (17%).
- High school students with special needs selected Tech-Prep because it was the best program offered that met their needs (29%), and they were interested in the program (29%).
- Nearly half of post-secondary students (43%) selected Tech-Prep because it was "good for getting into college".

Data from student focus groups supported the above findings. Students stated that guidance counselors and teachers played a significant role in their entry into Tech-Prep. When asked why they became involved, students responded that they enrolled because: (1) they wanted to; (2) they were selected to be in it by guidance counselors; and (3) teachers recruited them.

TABLE S-12

REASONS FOR ENROLLING IN TECH-PREP – PERCENT

Reason	HS Students	HS Special Needs	P-S Students
Interested In/Liked Program/ Something New	22	29	16
Interested In Subject Matter	12	10	5
Good For Getting Into College	13	3	43
Good For Career	17	7	11
Challenging	1	4	2
Need Specific Credits	8	14	0
Chance To Learn	17	9	21
Best Program Offered	11	29	4
Placed In/Told To Enter	8	6	4
Other Reason	7	6	11

Guidance counselors, college admissions officers, and post-secondary administrators were probed during their interviews on who should be enrolled in Tech-Prep. High school guidance counselors said they based recruitment on students' interests, initiatives, and choice. Some guidance counselors also said that they encouraged students who were interested in technology, applied study, and/or seamless curriculum, while others stated that they decided which students should go to Tech-Prep based on test scores and report cards. The majority of post-secondary administrators and admission staff said that students were not identified as Tech-Prep students. However, many suggested the need for a system of *"flagging"* Tech-Prep students so that their college could do a better job of supporting students enrolled in the program.

TABLE S-13

DIFFICULTY IN TRANSITION FROM HIGH SCHOOL TO COLLEGE
PERCENT

Difficulty of Transition	P-S Faculty	HS Faculty	P-S Students
Extremely Difficult	3	0	0
Very Difficult	2	5	5
Some Problems	43	39	32
Little Problem	41	48	33
No Problem At All	11	8	30

Type of Difficulty	P-S Faculty	HS Faculty	P-S Students
Being Away From Home	20	28	1
Doing Assignments	24	24	27
Finding Their Way Around Campus	9	5	13
Getting To Know Faculty	18	9	9
Selecting Courses	17	16	25
Making Friends	9	8	13
More Responsibilities	42	40	30
Using Computers	3	7	9
Adjusting To A New Study Routine	48	44	50
Finding A Job	9	8	25
Other Type Of Difficulty	14	8	10

Transition to Post-Secondary Institutions:

High school teachers, post-secondary faculty, and post-secondary students were asked for their perceptions of the difficulty experienced by Tech-Prep students in making the transition from high school to college. Results are presented in Table S-13. Teachers and administrators perceived a greater degree of difficulty among students in making the transition than did the students themselves. Approximately 30% of the students indicated they had no problem, only 11% of the post-secondary faculty and 8% of the high school faculty perceived that there were no problems.

When respondents were probed about the specific difficulties that might affect transition, both similarities and differences in perception were identified.

- The two greatest difficulties according to all respondents was taking on *"more responsibilities"* and *"adjusting to a new study routine"*.
- The biggest discrepancy occurred with the item *"being away from home"*. Both high school and post-secondary faculty predicted that this might have a considerable impact on transition, but students' responses indicated that this was not the case.
- Finding a job was an issue for students. Faculty and teachers did not perceive this as posing a difficulty; however, 25% of the students said this was a major difficulty.
- Other significant difficulties were related to doing assignments and selecting courses.

Evaluation Question Three: How Is Tech-Prep Implemented?

The purpose of this question was to determine how Tech-Prep was implemented within three domains: 1) the designing and developing of Tech-Prep programs, 2) the designing and presenting of Tech-Prep curriculum, 3) and the developing and sharing of professional Tech-Prep knowledge. Each of these areas was addressed through surveys as well as follow-up questions during interviews. A summary of results for each is presented below.

Designing & Developing Tech-Prep Programs:
Staff Members Involvement:

Secondary and post-secondary faculty, administrators and guidance counselors were asked to indicate their involvement in activities related to the development of Tech-Prep programs. Table S-14 summarizes their responses. Findings indicate that:

- The majority of administrators surveyed at both high school and post-secondary institutions have been involved in designing and/or developing their Tech-Prep program.
- Approximately half of the high school guidance counselors have assisted in planning, but fewer have assisted in the development of articulation agreements,
- Post-secondary counselors had little involvement in planning the program, and
- Less than half the post-secondary faculty and only one-third of the secondary faculty have helped with designing their Tech-Prep program.

TABLE S-14

INVOLVEMENT IN DESIGN AND DEVELOPMENT – PERCENT

Type of Involvement in Tech-Prep During the Last Three Years	High School			Post-Secondary		
	Teachers	Admins	Counselors	Faculty	Admins	Admissions
Served on the Planning Committee for Tech-Prep	37	70	51	40	63	5
Participated in Tech-Prep Meeting with Business or Community Leaders	43	77	53	47	66	19
Helped Develop the Articulation Agreements Between High Schools and Colleges	31	53	27	45	61	16
Conducted Workshops/Training on Tech-Prep	26	34	23	31	22	19

Interview data supported these findings. At the high school level teacher involvement was typically characterized by teaching Tech-Prep courses. The most common activity reported by high school administrators was participation in Tech-Prep meetings with business or community leaders. Administrators also indicated they were often involved with planning committees for Tech-Prep, especially those involved with developing articulation agreements and developing new curricula. Guidance counselors' greatest involvement with Tech-Prep was in advising students although many guidance counselors participated in planning committees and in meetings with businesses.

At the post-secondary level, the faculty's most significant involvement with Tech-Prep was with curriculum development. Faculty have participated on planning committees, met with businesses, and been involved with developing articulation agreements. Post-secondary administrators have most commonly been involved with planning committees, meeting with businesses, and developing articulation agreements. The lowest levels of involvement among post-secondary stakeholders was found among the post-secondary admissions counselors. These respondents indicated that they frequently did not know which students were Tech-Prep students and generally were not aware of curriculum requirements specific to Tech-Prep.

Involvement of Steering Committees and Articulation Agreements:

As part of the documentation of designing and developing Tech-Prep, interview questions also probed the importance of steering committees and the role of articulation.

Interviews with consortia directors indicated that steering or advisory committees played an important role during the implementation of the Tech-Prep program. Representatives included: business persons, BOCES staff, school-to-work members, guidance counselors and career center staff, PTA

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members, administrators such as high school principals, and superintendents, teachers, and, at the post-secondary level faculty and deans. Frequency of meetings of the steering committee varied considerably. Some meetings were held monthly, others quarterly, bi-yearly or yearly. Other groups also acted in an advisory capacity for Tech-Prep programs. These included school-to-career-committees, vocational advisory councils, and school boards. Some consortia did not have a group that acted in an advisory capacity. In these consortia, the lines of communication and planning were informal and used existing administrative structures.

Because of the importance of the role of articulation agreements in Tech-Prep, administrators at the high school and post-secondary levels were probed further regarding their roles in the development of articulation agreements. Interviewees indicated that articulation agreements were very important to the functioning of Tech-Prep programs; however, use of the agreement was not as high. Half of those interviewed were aware that articulation agreements were involved during implementing Tech-Prep, but about a fourth of those interviewed did not believe that articulation was part of their Tech-Prep program. These respondents indicated that their schools already had sufficient articulation agreements in place and that these were used for Tech-Prep students. Some administrators indicated that articulation was considered unimportant, or was even *"inconsequential."*

Overall, the range of opinions of articulation agreements ranged from *"critical"* to *"good"* for teachers and parents, and *"not so good"* to *"just a piece of paper"* for students.

Designing & Presenting the Tech-Prep Curriculum:

High school and post-secondary stakeholders were asked to identify their level of involvement in designing and presenting Tech-Prep curricula. Responses for high school and post-secondary faculty, administrators, and counselors are presented in Table S-15.

Findings indicate that:

- The majority of high school teachers (69%) have helped to develop Tech-Prep curriculum and 85% are teaching or have taught either applied or integrated courses related to Tech-Prep.
- An equivalent number of post-secondary faculty (65%) have helped develop curriculum; however, fewer (36%) have taught or are now teaching applied or integrated Tech-Prep courses.
- Approximately half of the administrators in high school settings and one-third of post-secondary administrators are involved in curriculum issues related to Tech-Prep. Counselors at the high school level see their major role in presenting curriculum as that of recruitment. About half of the high school teachers and administrators are also involved in advisement and recruitment.

Interviews with high school and post-secondary faculty were used to provide additional information pertaining to the development of Tech-Prep curricula. Several important themes emerged from the analysis of responses.

TABLE S-15

INVOLVEMENT IN CURRICULUM DESIGN -- PERCENT

Type Of Involvement In Tech-Prep During The Last Three Years	High School			Post-Secondary		
	Teachers	Admin	Guidance Counselors	Faculty	Admin	Admissions Counselors
Helped Develop Tech-Prep Curriculum	69	52	21	65	34	6
Taught Tech-Prep (Applied, Integrated) Course	85			36		
Advised Students on Tech-Prep Recruitment and Options	47	52	81	26	20	38

High School Teachers Perceptions of Curriculum:

High school teachers identified differences between the methods by which traditional courses were taught and the methods by which Tech-Prep courses were taught. Tech-Prep courses were described as hands-on, applied, yielding real-life, practical experience, more use of labs, problem-solving activities, explanations, and concrete examples. Teachers indicated that more attention is paid to job activities, such as oral communication, role-playing, interviewing, writing resumés, and applying for jobs. Interaction between the teachers and students, and one-on-one interaction are dramatically increased. This affords closer relationships between teachers and students. As stated by one teacher, *"In terms of understanding and application these kids are getting things many Regents students are not."* Many stated that the difference between their Tech-Prep classes and non-Tech-Prep classes was not the content of the curriculum, but the choices of what to emphasize, when to present the material, and how to present it. Major goals included seamlessness in the curriculum, elimination of remediation, and decrease in wasted teaching time, allowing more advanced techniques to be taught. Working in groups and increased public speaking increased the *"show and explain"* content and decreased the *"lecture and write"* content.

Tech-Prep also has enabled teachers to obtain new teaching materials, support from post-secondary schools, and support from businesses. Projects are usually geared toward a specific job or business. Visits to business organizations, visits from spokespeople from industry, and speakers addressing a variety of job market needs are part of the curriculum.

When asked about some things that worked well when implementing the Tech-Prep curriculum, high school teachers responded as follows:

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- The applied nature of the projects created realism for the students, *"what kids learn in technology courses validates what they have been learning in other academic courses."*
- In many sites, class size was smaller and pupil attention was increased.
- Students enjoyed working, discovering, and learning more independently.
- Students practice problem-solving on their own.
- Students were learning how to control themselves, maintaining higher levels of responsibility, managing their time better, and controlling the outcomes.

For teachers, curriculum freedom meant adjustment to a fluid curriculum:

- Teachers were more able to demonstrate their experience and become involved in the topic.
- Teachers were helping each other and used similar and consistent strategies.
- Teachers were communicating with those in other buildings, including both other high schools and people in the post-secondary institutions.
- Teacher to administration communication was greater.

Post-Secondary Faculty Perceptions of Curriculum:

Implementation of curriculum for the post-secondary faculty also was viewed in a positive manner but in a slightly different way. In general, post-secondary faculty viewed Tech-Prep as an opportunity to recruit, as a means of providing a link with business and community, and as a way of improving students' responsibility for their own learning.

- Faculty indicated that the guidance counselor at the respective high school was in the most critical position for this program, but that follow-through is needed at the post-secondary level. They would like more dedication of the admissions and counseling time to Tech-Prep so that students would be identified as part of the Tech-Prep program.
- The faculty commented on the applied nature of the courses, the increased student-teacher interaction, the career orientation, and the increase in the amount of material that can be covered.
- Faculty indicated that the continued role of and support of local businesses is important, but that their assistance is needed in increasing this involvement.

Students' Perceptions of Curriculum:

During their focus groups, students were asked for their impressions of the delivery of the Tech-Prep curriculum. Specifically, they were asked whether or not the Tech-Prep program was covering what they would need to know to be successful in a future job and to give examples of things that were covered that were job-related. A summary of responses includes:

- Students unanimously responded *"yes"*, they were getting the knowledge and skills needed to get a job and to be successful.
- Specific examples that were considered helpful included a range of activities from internships, and resumé writing to taking responsibility and creating cover letters.

- Students said that the smaller class sizes improved their study skills.
- When asked about what has been least useful, the students were not able to relate anything that would not be, in at least some way, helpful.

Developing & Sharing a Professional Tech-Prep Knowledge Base:

The final area related to the delivery and implementation of Tech-Prep was the development of a professional knowledge base. This included local impact (knowledge base to be used at the local school by local staff) and regional/national impact (knowledge base to be used across multiple districts, regions, or the national level). Methods of establishing this knowledge base ranged from visiting other programs to presenting Tech-Prep materials at the national level. All staff participating in Tech-Prep were asked to indicate their degree of involvement via a pencil and paper instrument. These findings are summarized in Table S-16. Findings include:

- Only a few of the participants have visited other Tech-Prep sites, but many have attended conferences where they could hear about other sites.
- One-fourth to one-third of all stakeholder groups have conducted training at the local or regional level.
- Guidance counselors are the most active participants at the regional level.
- No major differences are found for this area between secondary and post-secondary teachers and administrators, but a major difference was found for high school guidance counselors and post-secondary admissions counselors.

TABLE S-16

SHARING PROFESSIONAL TECH-PREP KNOWLEDGE BY STAKEHOLDER -- PERCENT

Professional Sharing Activities During The Last Three Years	HS Teachers	Admin	Guidance Counselors	Post-Sec. Faculty	Admin	Admissions Counselors
Visited Other Tech-Prep Programs	27	34	28	19	22	19
Attended National or Regional Conference on Tech-Prep	58	58	35	38	44	31
Presented Material at Regional Tech-Prep Conference	20	17	64	15	17	22
Presented Material at National Tech-Prep Conference.	2	5	1	3	7	0

Evaluation Question Four: What Support Mechanisms Are In Place For The Tech-Prep Staff?

The purpose of the fourth evaluation question was to document processes and issues related to support for Tech-Prep. Data were collected through surveys and interviews. High school teachers and administrators, and post-secondary faculty and administrators completed surveys. High school and college administrators' interviews included questions on this topic.

Faculty & Classroom Support:

Teachers and administrators at the high school level, and faculty and administrators at the post-secondary level were asked to address three kinds of support for Tech-Prep; specifically, planning time, staff development opportunities, and access to materials for the classroom. The secondary and post-secondary responses are summarized in Tables S-17 and S-18, respectively. The findings include:

- At the high school level, it appears that, in general, support was provided for classroom materials and staff development; 84% of teachers and 88% of administrators indicated that they had sufficient or outstanding support for classroom materials; 84% of teachers and 99% of administrators perceived sufficient support for staff development.
- At the high school level, perceptions of support for planning varied. Only 69% of the teachers indicated that they had enough planning time; 87% of administrators thought they did.
- At the post-secondary level respondents generally indicated sufficient support for staff development (92% administrators, 81% faculty);
- Post-secondary faculty indicated insufficient support for classroom materials 12% of the time and no support 26% of the time, compared to administrators who indicated insufficient support 6% of the time and no support 6% of the time.
- Eleven percent (11%) and 25% of post-secondary faculty perceived insufficient time, and no support for planning, respectively. Administrators responded 18% and 3%, respectively.

Areas for Future Staff Development:

In addition to the above information pertaining to staff development, faculty, counselors and admissions staff, and administrators at both the secondary and post-secondary levels were asked specifically about their involvement in staff development opportunities. The purpose of this question was to address future areas of staff development which might be provided. Secondary and post-secondary responses are summarized in Tables S-19 and S-20, respectively. Major findings include:

- Teachers and guidance counselors would like staff development on topics related to recruitment and placement of students, school/business relationships, school-to-work, and integration of vocational and academic courses.
- High school teachers would like staff development in curriculum design.
- Administrators at both levels have some need for staff development on integration of curriculum and job placement services.
- Post-secondary administrators would like information on school-to-work opportunities
- Admissions and guidance counselors would like information related to labor market trends, program promotion, school/business cooperation, and career counseling.

TABLE S-17

LEVEL OF SUPPORT FOR RESOURCES AS REPORTED BY SECONDARY TEACHERS & ADMINISTRATORS – PERCENT

Resource	Level of Support: Outstanding		Sufficient		Insufficient		No Support	
	Admin	Teacher	Admin	Teacher	Admin	Teacher	Admin	Teacher
Materials for Classroom	36	36	52	48	10	12	2	3
Staff Development	46	26	53	58	1	16	0	1
Planning time	32	13	55	55	11	27	1	5

TABLE S-18

LEVEL OF SUPPORT FOR RESOURCES AS REPORTED BY POST-SECONDARY FACULTY & ADMINISTRATORS – PERCENT

Resource	Level of Support: Outstanding		Sufficient		Insufficient		No Support	
	Admin	Faculty	Admin	Faculty	Admin	Faculty	Admin	Faculty
Materials for Classroom	21	20	67	43	6	12	6	26
Staff Development	24	23	68	58	6	6	3	13
Planning time	15	24	64	40	18	11	3	25

TABLE S-19

SECONDARY STAFF DEVELOPMENT NEEDS -- PERCENT

Staff Development Content	High School Administrators				High School Teachers				High School Counselors			
	Have Attended	Will Attend	Would Like to Attend	No Need Attend	Have Attendd	Will Attend	Would Like to Attend	No Need Attend	Have Attendd	Will Attend	Would Like to Attend	No Need Attend
General Information About Tech-Prep	91	3	3	4	85	5	4	6	71	21	5	3
Recruitment, Placement, and Retention of Students for Tech-Prep	66	5	18	11	41	8	33	18	46	34	15	5
School Relationship With Business/Industry/Labor	65	10	22	3	37	10	46	7	25	34	37	4
School-to-Work Information	78	12	9	1	51	10	34	6	29	45	24	1
Integrating Vocational and Academic Content	65	10	22	3	50	10	35	6	41	34	22	4
Promoting Cooperation Between Secondary and Post-Secondary Staff	64	15	15	5	42	13	36	9	31	35	29	6
Job Placement Assistance for Students	39	13	27	25					13	33	48	5
Curriculum Development					59	11	24	6				
Information on Labor Market Trends									22	35	37	7
Methods of Promoting Tech-Prep to Various Consumers									23	37	27	12
Promoting Cooperation Between Secondary and Post-Secondary Staff									22	32	37	10
Career Development Counseling for Students									38	28	31	3

TABLE S-20

POST-SECONDARY STAFF DEVELOPMENT NEEDS – PERCENT

Staff Development Content	Post-secondary Administrators				Post-secondary faculty				Post-secondary Admissions			
	Have Attended	Will Attend	Would Like Attend	No Need Attend	Have Attendd	Will Attend	Would Like Attend	No Need Attend	Have Attendd	Will Attend	Would Like Attend	No Need Attend
General Information About Tech-Prep	91	0	0	10	76	5	6	13	60	17	17	7
Recruitment, placement, and Retention of Students for Tech-Prep	41	14	30	16	40	11	28	21	30	30	33	7
School Relationship with Business/Industry/Labor	55	8	25	13	42	10	34	14	19	32	23	26
School-to-Work Information	61	10	22	7	37	14	33	17	32	29	19	19
Integrating Vocational and Academic Content	55	13	28	5	50	9	31	11	20	30	27	23
Promoting Cooperation Between Secondary and Post-Secondary Staff	63	10	18	10	48	7	23	22	10	19	39	32
Job Placement Assistance for Students	22	5	38	35					17	10	43	30
Curriculum Development					62	7	19	13				
Information on Labor Market Trends									16	13	52	19
Methods of Promoting Tech-Prep to Various Consumers.									16	23	45	16
Promoting Cooperation Between Secondary and Post-Secondary Staff									16	23	45	16
Career Development Counseling for Students									23	27	20	30

Organizational Support:

Respondents were asked how much support they received from other Tech-Prep stakeholders. Specifically, they were asked about support received from other faculty and teachers, guidance/admissions counselors, administrators, and the business community. Tables S-21 and S-22 summarize these data.

- High school respondents indicated that support from teachers and administrators was generally satisfactory or outstanding
- Support from high school guidance counselors was rated some what lower, especially by teachers.
- Support from the business community was rated the lowest by all high school respondents. Teachers, especially, perceived that there was inadequate support from the business community.
- Post-secondary faculty and administrators perceived sufficient to outstanding support being provided by their peers.
- Post-secondary faculty perceived that the level of support from admissions counselors was low; 44% of the post-secondary faculty indicated that they received limited support from admissions counselors.
- Almost 50% of post-secondary faculty and 27% of administrators perceived insufficient support from the business community.

TABLE S-21

LEVEL OF SUPPORT FROM HIGH SCHOOL PEERS -- PERCENT

Level of Support	Response From	Support From: Faculty & Teachers	Guidance Counselors & Admissions Counselors	Administrators	Business Community
Sufficient to Outstanding	High School Administration	90	80	94	55
	High School Teachers	78	68	82	52
Insufficient to No Support	High School Administration	10	21	7	45
	High School Teachers	22	32	18	49

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TABLE S-22

LEVEL OF SUPPORT FROM COLLEGE PEERS -- PERCENT

Level of Support	Response From	Support From: Faculty & Teachers	Guidance Counselors & Admissions Counselors	Administrators	Business Community
Sufficient to Outstandg	Post-secondary Administration	90	87	92	73
	Post-secondary Faculty	84	56	70	55
Insufficient to No Support	Post-secondary Administration	10	13	8	27
	Post-secondary Faculty	16	44	30	45

Interview Responses to Organizational Support:

Interviews with stakeholders supported and added to the above findings; implementation of Tech-Prep programs required a variety of support mechanisms and resources. Some of the most commonly mentioned included: time, money, classroom materials (such as curriculum materials, supplies, textbooks, computer equipment), staff development, and space.

Need for Time: The most frequently mentioned need was for 'time'. All respondents indicated that they used a great deal of time to implement Tech-Prep, and that they needed more time to continue the successful implementation.

Need for Funds: A number of respondents indicated that budgetary support was a major concern in terms of needed resources. When asked how they currently supported Tech-Prep, a variety of responses were given. Some implemented special Tech-Prep budgets; some incorporated the Tech-Prep needs into already existing budgets; some combined funding with special grants (i.e., Goals 2000) and some had grants from businesses. Several schools indicated that they currently had no funds with which to continue Tech-Prep, if federal/state funds were withdrawn. The administrative quote *"If federal funding went away, Tech-Prep here would not continue"* is representative of many of the responses provided on future funding needs.

Need for Business Support: Interview data from teachers and administrators suggest that the issue of support from the business community is consortium-specific, not statewide; that is, this problem may exist for some consortia, but not for others. For instance, respondents from some consortia provided positive examples of their involvement with the business community (e.g., *"The business community loves Tech-Prep, and they have been pivotal in the whole effort."*) Some of the specific positive aspects included student opportunities for job shadowing, internships in such places as hospitals and in

manufacturing, and mentoring in electronic fields. Other positive aspects of the business relationship, that were noted, included the provision of computers and modest financial support. These relationships often occurred as *"in kind"* commitments; where businesses provide equipment and training and the schools provided interns that were better qualified. Support from businesses could be represented by the following quote:

"...they (the businesses) want to hire our graduates, and they have not always been able to do that. Their input ensures that students acquire the skills they need in the work place."

Among consortia where support from the business community was perceived as *"not adequate"*, the relationship was often described as difficult to develop. Many reasons were cited for this difficulty. In rural areas there was a lack of big industry base; in others, there were no large businesses close enough to work with the schools. An additional problem mentioned within some consortia was the presence of too many other competitors for business support; an example being School-to-Work. In some consortia or schools, where the relationship with the business community was not what it might be, there was usually a strong feeling that the consortia needed more business involvement. One specific area of input that was often noted in the interview process as desired by schools from the business community was involvement with curriculum writing.

Evaluation Question Five: What Are The Perceived Outcomes Of Tech-Prep?

The purpose of the fifth evaluation question was to determine the perceived outcomes of the New York State Tech-Prep Program for various stakeholders. Individual summaries are provided for (1) outcomes related to students, (2) outcomes contributing to development of program staff, and (3) outcomes contributing to community, business, and school relationships.

Outcomes Related to Students:

Perceived outcomes related to students were collected from multiple stakeholder groups. Students, staff, consortia directors, and local decision-makers were asked to indicate their perceptions of student outcomes. Both quantitative and qualitative methods were utilized to obtain the data.

Student Perceptions of Outcomes:

High school students, high school students with special needs, and post-secondary students were asked to indicate their perceptions of outcomes related to Tech-Prep in three ways. First, they were asked to indicate degree of agreement with a series of Likert-type items regarding their immediate perceptions of Tech-Prep classes. The responses to these items are summarized in Table S-23. Second, students were asked to indicate, using a checklist, the skills that they had gained as a result of participation in Tech-Prep. Responses to these items may be found in Table S-24. Finally, students were asked to provide their career goals post-high school and post-higher education. These responses are summarized in Tables S-25 through S-28.

General Perceptions:

Examination of the data presented in Table S-23 indicates that the majority of students involved in Tech-Prep had positive perceptions of the program. Notable findings include:

- More than 70% of the high school students 'strongly agreed'/ 'agreed' with 6 of the 10 items. These items were: *"Classes cover the material I need to know," "The classes are very job-oriented," "The class size is good," "The classes are interesting to me," "The classes are preparing me to get a good job,"* and *"The classes have improved my thinking skills."* In addition, 60-70% of the high school students strongly agreed/agreed with: *"The classes have increased my awareness of different jobs," "The classes make me work hard,"* and, *"The classes increase my motivation for learning."*
- The percentage of high school students with special needs who were in the 'strongly agree/ agree' category was lower than that of high school students on most items. More than 70% of the high school students with special needs 'strongly agreed/agreed' with, *"The class size is good"* and *"The classes make me work hard."* However, a lesser amount, only 50-70%, 'strongly agreed'/'agreed' with 3 of the remaining 8 items, which were: *"Classes cover the material I need to know," "The classes are interesting to me,"* and *"The classes have improved my thinking skills."*
- A larger percent of post-secondary students were in agreement with many of the items. Over 80% 'strongly agreed/ agreed' with: *"Classes cover the material I need to know"* and *"The class size is good;"* 70-80% 'strongly agreed/agreed' with 5 items, which were: *"The classes make me work hard," "The classes are interesting to me," "The classes are preparing me to get a good job," "The classes are increasing my motivation for learning,"* and *"The classes have improved my thinking skills."* Sixty to seventy percent (60-70%) 'strongly agreed/ agreed' with: *"The classes are very job-oriented"* and *"My self-esteem has increased because of involvement in Tech-Prep."*
- A relatively small percentage of high school students and high school students with special needs, responded positively to the item related to Tech-Prep increasing the students' self-esteem.

Specific Skills:

Displayed in Table S-24 is the percentage of students who indicated that a obtaining a specific skill was the result of participation in Tech-Prep. Notable results from this section included:

- Over 70% of both the high school students and the high school students with special needs indicated that because of Tech-Prep they learned: *"the ability to work cooperatively", "how to follow directions"*, and *"using common sense"*. Over 80% of the high school students with special needs checked the latter skill.
- Over 60% of the post-secondary students indicated that because of Tech-Prep they learned: *"how to write a résumé", "how to prepare for a job interview"*, and the *"ability to work cooperatively."*
- The skills that the smallest percentage of high school students and high school students with special needs checked that they learned because of Tech-Prep were: *"specific reading skills for the job", "dealing with frustration on the job"*, and *"punctuality with time schedules."*
- Post-secondary students indicated that the job skills most frequently learned from Tech-Prep were related to getting jobs and general work skills. These skills were: *"how to write a résumé", "how to prepare for a job interview", "ability to work cooperatively"*, and *"ability to manage my time effectively."*

TABLE S--23

STUDENT PERCEPTIONS OF TECH-PREP -- PERCENT

Perceptions of Tech-Prep	Post-Secondary Students			High School Students			High School Students Special Needs		
	Strongly Agree/ Agree	Slightly Agree/ Disagree	Disagree / Strongly Disagree	Strongly Agree/ Agree	Slightly Agree/ Disagree	Disagree / Strongly Disagree	Strongly Agree/ Agree	Slightly Agree/ Disagree	Disagree / Strongly Disagree
Classes Cover the Material I Need to Know	87	13	0	78	19	3	57	39	5
Classes are Very Job-Oriented	69	30	2	70	25	5	42	41	19
Class Size is Good	81	15	4	79	16	5	74	15	11
Classes Have Increased My Awareness of Different Jobs	55	42	4	64	28	7	43	36	21
Classes Make Me Work Hard	70	28	2	69	26	6	71	22	7
Classes are Interesting to Me	77	20	4	73	21	6	60	24	16
Classes are Preparing Me to Get a Good Job	75	25	0	71	23	6	44	35	21
Classes Increase My Motivation for Learning	78	22	0	65	28	7	45	40	17
Classes Have Improved My Thinking Skills	78	22	0	73	23	4	61	30	8
My Self-Esteem Has Increased Because of Involvement in Tech-Prep	64	28	8	48	35	17	35	34	31

Career Goals:

High school students and high school students with special needs were asked what they planned to be doing 6 months after graduating from high school and five years after graduating from high school . The responses to these questions are summarized in Tables S-25 and S-26.

- A majority of high school students and high school students with special needs indicated that they planned to attend some type of post-secondary institution within six months of graduating from high school. Over 80% of high school students and high school students with special needs reported that they were planning on continuing with some type of higher education.
- When asked about their long term goals, a large majority of students, 75% of the high school students and 82% of the high school students with special needs, stated that they would be working five years after high school. A smaller percentage, 18% of the high school students and 22% of the high school students with special needs, gave a general response of "*being in college,*" while 6% of the high school students and 7% of the special needs students stated that they would be in graduate school.

TABLE S-24

TECH-PREP OUTCOMES: SKILLS LEARNED THROUGH TECH-PREP BY STUDENTS – PERCENT

Tech-Prep Skills	High School Students	High School Special Needs	Post-Sec Students
Use of Specific Job Skills	64	52	56
How to Write a Résumé	38	15	66
How to Prepare for a Job Interview	41	16	66
Ability to Work Cooperatively	77	78	60
Ability to Manage My Time Effectively	58	68	58
How to Follow Directions	76	77	56
Responding to Feedback From My Boss	44	43	40
How to Plan for Work to be Done	63	63	49
Generating Alternate Problem-Solving Strategies	55	57	36
Learning to Pay Attention	63	66	51
Using Common Sense	72	81	47
Remembering How to do Things Day to Day	50	55	40
Workplace Social Skills	52	58	46
Dealing With Frustration on the Job	43	48	33
Punctuality With Time Schedules	46	49	40
Specific Reading Skills for the Job	42	42	27
Specific Math Skills for the Job	53	54	40

• When asked directly, *"Do you plan to go to college?"* 95% of the high school students and 90% of the high school students with special needs said, *"Yes"* (see Table S-27). The three most popular areas of specialization for the high school students were Engineering Technology (25%), Health/Human Services (23%), and Business/Office/Marketing (20%) The three most popular areas of specialization for the high school students with special needs were Health/Human Services (20%), Arts/Humanities (17%), and Engineering Technology (15%).

Post-secondary students were asked what their plans were for 6 months and 5 years after graduating from college. The results are presented in Table S-28. Findings included:

• 47% stated that they would be working 6 months after college, but they did not specify in what field.

• 29% stated that they would be working in a field very similar to their area of concentration in school.

• 13% said that they would be in school, for example, transferring to another school, going to graduate school, or going to law school.

TABLE S-25

FUTURE PLANS: SIX MONTHS OUT OF HIGH SCHOOL -- PERCENT

Plans	HighSchool Students	High School Students Special Needs
Go to College - General	72	65
Go to College - 2 year	4	12
Go to College - 4 year	2	2
Technical School	3	1
Work	22	26
Military Service	5	54
Take Time Off	2	1
Undecided	3	6
Other	1	1

When asked what they would be doing 5 years after graduating from college, responses included:

• 50% said that they would be working but did not specify in which field.

• 37% said that they would be working in a field similar to their area of concentration.

• 4% said that they would be in either graduate or a non-specified type of school; 4% said that they would be in medical school.

• 4% were undecided as to what they would be doing.

TABLE S-26

FUTURE PLANS: FIVE YEARS OUT OF HIGH SCHOOL -- PERCENT

Plans	High School Students	High School Students Special Needs
College	18	22
Graduate School	6	7
Medical School	2	0
Working	75	82
Military Service	3	7
Undecided	5	15
Other	2	0

TABLE S-27

HIGH SCHOOL STUDENTS: FUTURE AREA OF EMPLOYMENT PERCENT

College Plans	High School Students	High School Students Special Needs
Do not plan on college	5	10
Plan on college	95	90
Specialization:		
Agriculture	2	3
Business/Office/Marketing	20	7
Engineering Technology	25	15
Health/Human Services	23	20
Mechanical/Industrial Trade	8	6
Arts/Humanities	10	17
Math/Science	4	6
Education	6	13
Undecided	10	17
Other	5	6

TABLE S-28

FUTURE PLANS: POST-SECONDARY STUDENTS -- PERCENT

Future Plans	6 Months Out Of College	5 Years Out Of College
Grad School/More School	11	4
Law School	2	0
Medical School	0	4
General Working	47	50
Working in Tech-Prep Field	29	37
Working in non-Tech-Prep Field	0	2
Military Service	4	0
Take Time Off	4	0
Undecided	4	4

Program Staff Perceptions of Student Outcomes:

High school teachers, guidance counselors, and administrators, and post-secondary faculty, admission/career counselors, and administrators also were asked to respond to survey items pertaining to a variety of direct student outcomes as a result of Tech-Prep. The results from these survey items are summarized in Table S-29. Interview data from program staff provided additional supporting documentation of perceived student outcomes.

Examination of Table S-29 indicates that program providers' perceptions of student outcomes related to participation in Tech-Prep were positive. Results included:

- Over 90% of respondents agreed that: *"Tech-Prep is beneficial for (former general program and Regents program) students", "Tech-Prep helps to orient students to current work place requirements," "I believe that the Tech-Prep program helps retain students who may have been at-risk," "Students have positive attitudes about their experiences with Tech-Prep," "Student self-esteem is raised because of the Tech-Prep program,"* and *"Tech-Prep effectively prepares students for post-secondary education and/or future employment."*
- Over 70% agreed that: *"Students seek more career guidance after joining Tech-Prep," "Tech-Prep courses are appropriate for college-bound students,"* and *"Students in the Tech-Prep program are more focused on career goals than are non-Regents program students."*
- Over 95% of all program staff agreed with the statement, "*Student self-esteem is raised because of Tech-Prep."* This is contradictory to student responses to a similar item, where less than 50% of the high school students and the high school students with special needs agreed.

TABLE S-29

STAFF PERCEPTIONS OF TECH-PREP -- PERCENT

Perceptions	High School Teachers	High School Counslrs	High School Admin	Post-Second Faculty	Post-Second. Admiss	Post-Second. Admin
Tech-Prep is Beneficial for Former "General Program" Students	94	96	96		97	
Tech-Prep is Beneficial for Students				98		100
Tech-Prep is Beneficial for "Regents Program" Students	88	90	100		90	
Tech-Prep Helps to Orient Students to Current Work Place Requirements	95	100	100	96	100	95
Tech-Prep Effectively Prepares Students for Post-Secondary Education and/or Future Employment	94	96	99	97	100	100
I Believe That the Tech-Prep Program Helps Retain Students Who May Have Been At-Risk	91	95	99	99	97	98
Students Have Positive Attitudes About Their Experience in the Tech-Prep Program	96	95	99	98	100	100
Student Self-Esteem is Raised Because of Tech-Prep Program	95	96	100	98	100	100
Students Seek More Career Guidance After Joining Tech-Prep	81	81		98	92	
Tech-Prep Has Not Changed Vocational Education	43	37		19	27	
Tech-Prep Courses Are Appropriate for College-Bound Students	87	77		89	90	
Students in the Tech-Prep Program are More Focused on Career Goals Than are Non-Regents Program Students	77	77			85	

Qualitative data collected during interviews supported the above findings. Specific comments by stakeholders are presented below:

High School Teacher Comments:

Overall, teachers perceived Tech-Prep as contributing to three areas: 1) students' academic achievement, 2) students' attitudes toward school and self, and 3) students' behavior. Teachers' comments related to perception of an increase in students' academic achievement as a result of Tech-Prep include:

- Students see the importance of what they were learning; Tech-Prep courses have a practical use.
- Students play a more active role in their learning.
- Tech-Prep keeps more students in school because of the strong connection between school and career; students learn about this connection and become more focused on their future careers.
- Students are willing to take more difficult courses.
- More students want to go to college.

Comments related to teachers' perceptions of improved student attitudes because of participation in Tech-Prep include:

- Student motivation increases because of Tech-Prep as does students' self-confidence.
- Students are motivated to take higher level courses.
- Students are more enthusiastic and see a greater value in what they are learning.

Comments focusing on improvement in students' behavior are as follows:

- The increase in teamwork among the students is beneficial to their social skills.
- There is a decrease in intimidation among the students and more friendly competition.
- Students develop interpersonal as well as problem-solving skills.

College Faculty Comments:

Post-secondary faculty also had positive comments about the impact of Tech-Prep on students.

The majority of their responses emphasized outcomes related to academic achievements. Comments representative of post-secondary faculty include:

- Tech-Prep keeps students in school.
- Tech-Prep teaches students how to be independent and critical thinkers.

High School Guidance Counselors Comments:

High school guidance counselors indicated the academic advantages of Tech-Prep for selected students, especially those who were not enrolled in the Regents track. They also emphasized the impact

of Tech-Prep on student outcomes related to social and emotional growth and career selection. Sample comments included:

- Students' self-esteem increases.
- Students are better prepared for the job market, especially in technology.
- Tech-Prep promotes social skills for the students.
- Tech-Prep exposes students to more experiences and networking.
- Students' academic performance is improved.
- Students are provided with alternative types of learning/instruction.
- Students show a greater interest in going to college.
- There is more engagement between teachers and students.

Consortia Directors' Perceptions of Student Outcomes:

When consortia directors were asked how the Tech-Prep program benefited students, they provided a variety of responses. These included:

- Students are better focused on their field of interest.
- Students experience more "*hands-on*" learning and more relevant work.
- Study skills of the students are increased.
- Students' motivation increases.
- Students' attendance improves.
- Transition from high school to post-secondary and from school-to-work is easier.
- Students are better prepared for their careers and develop marketable skills.
- Students are better prepared for college.
- Duplication of course work at college is eliminated.
- Students improve their critical thinking skills.
- Students can transfer credits from high school to post-secondary.
- Increased rigor.
- There is no difference between Tech-Prep and Regents program.
- Tech-Prep encourages a team approach.
- Tech-Prep uses a work-study approach.

The opinions of the site directors can be more clearly seen in the following quotes:

- *"Tech-Prep lets the kids see the bigger connection and the reason why they are going to school, the connection between high school, college, work world, and other responsibilities."*
- *"A student summed it up well when she said, 'Now when I go to college, I already know how to write a college paper, where the bookstore and library are, where to park, how to use their resources. I can go and concentrate on why I am there. And I know I can do it. I did a college course as a junior in high school and got a B, and the teacher did not know I was a BOCES student."*
- *"The program's most important aspect is its ability to bring relevant experience to the classroom. Students have very few life experiences from which they can draw upon to make connections; Tech-Prep allows them to do that. In addition to that, Tech-Prep does something for the middle 50% of students that is traditionally not done. Traditional academic approaches do not address the varying*

learning styles of the student."

- *"An informal evaluation found out that students are more apt to attend, enjoy, and can understand why they are learning. Especially in applied math, students can feel 'Ah-hah' more. Students enjoy doing things instead of just sitting in the class. Some of their grades are now B+ which were C's before."*

Local Decision Makers' Perceptions of Student Outcomes:

Responses of local Tech-Prep decision-makers echoed those of many of the other stakeholders. Community members, business representatives, and school board members perceived Tech-Prep as contributing to student outcomes in the following ways:

- Students have broader options, more self-esteem, and motivation.
- Students have more marketable skills and more training than some of the actual employees.
- Students are able to be employed because they have gained work experience.
- Students are better prepared to compete at the college level because the quality of students graduating from high school is better.
- Those students that normally would have not enrolled in college are doing so.
- Standards have been raised and articulation agreements with various State University of New York campuses facilitate students' enrollment.

Outcomes Contributing to Development of Program Staff:

During their interviews, high school teachers and post-secondary faculty were asked, "What opportunities and/or challenges has Tech-Prep presented for you as a teacher". A variety of outcomes directly supporting instructional staff were noted. These include:

- High school teachers' relationships with others improved. For example, respondents indicated that involvement in Tech-Prep increased the quality of their relationships with other teachers, provided them with more opportunities to share information with other schools, and allowed them more opportunities to communicate with parents, community members, and businesses. Tech-Prep also changed their relationship with students.
- One teacher responded that Tech-Prep *"... expanded my horizons in teaching methods, away from lecture structure, adjusting to being a facilitator as opposed to 'king of the classroom' divulging information."*
- High school teachers believed they had become better teachers because of Tech-Prep. They were given more leeway in developing their curriculum, and were required to increase their involvement with businesses and business operation; they had to keep themselves more updated on current issues and applications; they had to change their style of teaching and had to teach in new and innovative ways.
- Teachers also indicated that they gained new knowledge that was important in and of itself. For instance, teachers believed that they were given more opportunities to attend training workshops and other types of staff development than were non-Tech-Prep teachers. Several teachers specifically indicated that they were given the opportunity to extend their math and science backgrounds.
- Post-secondary faculty saw Tech-Prep as a means to more in-depth contact with students and with high school teachers. They perceived this continuity as benefiting themselves, not just the students.

- Post-secondary admissions and career counselors also were asked about opportunities Tech-Prep had presented to them. They responded to this question by stating that Tech-Prep had given them the option to participate in job activities, such as field experiences and internships.

Outcomes Contributing to Community, Business, and School Relationships:

Administrators were asked about their school's relationship with local businesses and others in the community; that is, "*Has Tech-Prep enhanced your school's relationship with local business organizations, the community, and other secondary and post-secondary schools?*"

The majority of administrators indicated that their school's relationship with local businesses had been enhanced. Some of their comments included:

- The number of students interested in the business organizations had increased.
- Businesses provided sites for shadowing, apprenticeships, and library resources.
- Businesses provided them with advice for their curricula.
- Students were given tours of local businesses.
- Students participated in mock interviews with local businesses.
- Local businesses provided mentoring for the students.

Administrators also commented on their school's increased relationship with colleges. Comments included:

- There was an increase of communication between schools.
- The number of students going to post-secondary school increased.
- Students were better prepared for college, especially in math and science.

A few administrators commented on their school's relationship with other secondary schools indicating that secondary schools were communicating more with each other now and that high school teachers were coming together and working together more.

Evaluation Question Six: What Are The Perceived Barriers To Implementing Tech-Prep And What Areas Are In Need Of Improvement?

The sixth evaluation question was used to document the perceptions of stakeholders regarding barriers to implementation of Tech-Prep, areas of the Tech-Prep program in need of improvement, and future areas of emphasis. Data were collected via paper and pencil instruments and through interviews.

Barriers to Implementation:

Comments by Teachers and Faculty:

High school teachers and post-secondary faculty were asked, "*Are there currently any barriers to implementation of Tech-Prep? For instance, are there some things that did not work or that made*

implementation harder?" High school teachers identified several areas of concern.

- A major issue focused on a fear of program elimination and the need for continuous funding. This was supported by comments related to a need for: more teachers, more courses, more general materials, and funds for student transportation to and from the sites.
- The amount of time and effort needed for implementation and maintenance of the Tech-Prep program was also an issue. This included a need for: more common preparation time with other teachers, longer periods to work on projects, more lab time (in competition with Regents courses), and more staff development.
- Need for improved communication with a variety of groups and people was perceived as an issue for teachers. Topics included: weak relationship with post-secondary schools, need for better relationships with articulation, need for improvement in communication with guidance counselors, need for better public relations with the community, need for more administrative support in areas such as scheduling, and, need for more input from the state.
- Issues in the Tech-Prep curriculum also were discussed. Common topics included: the curriculum was too long, teachers had trouble finishing it; need for smaller class sizes; and, need for resource teachers for students with special needs.

Typical comments by teachers pertaining to barriers or areas in need of improvement include:

- *"Guidance counselors don't like working with the teachers and are by no means helping the situation of the projects. Not slotting the kids correctly hurts teachers, kids, and the program."*
- *"There is nothing from the state to tell me if I am going in the right direction."*

A large number of high school teachers expressed a perception of change in state standards as a barrier to the Tech-Prep Program. They feared that students who failed 7th and 8th grade math or science would now be placed in Tech-Prep courses even though it was not their specific career choice. Several teachers feared that administrators now viewed Tech-Prep as a sort of *"...dumping ground,"* or as one teacher put it, *"...a catchall for administrators to throw students who are non-Regents into."*

Post-secondary faculty were asked the same questions as were the high school teachers pertaining to barriers to implementation of Tech-Prep or areas in need of improvement. Their comments included the following ideas:

- Funding is a problem; no one is sure for how long the money will be there.
- Some faculty have the impression that Tech-Prep is just a fad and will eventually go away.
- There is a need for more faculty.
- There should be an increase in the number of students contacted to join Tech-Prep.
- Guidance counselors need to be more aware of and knowledgeable about the program.
- Guidance counselors need to treat the students as college-bound.
- There are accreditation and articulation problems for college credit.

<u>Areas in Need of Improvement</u>:

During interviews high school teachers, post-secondary faculty, and high school guidance

counselors were probed as to what resources they would need and from whom to improve Tech-Prep. Responses included:

- A need for more support from the federal government and the need for more money.
- A need for more high school--post-secondary programs.
- A need for more high schools to be involved.

Communication was stressed by most respondents, with ideas including needs for:

- More and better communication, for example: more communication among the students, parents, and community; more communication between guidance counselors and students; more time to work with high school faculty; and, more collaboration among faculty, high schools, and businesses.
- More communication and support from the school board and from administration.
- An increase in guidance counselors' involvement in the program.
- More articulation between schools.
- An increase in teacher involvement in the development of the program.

Improvements needed for the Tech-Prep curriculum were also discussed, with issues including need to:

- Update the curriculum.
- Provide less in-depth applications.
- Provide better guidelines.
- Provide better materials.
- Increase preparation of teachers and materials.
- Involve support staff in development, training, and delivery.

High school guidance counselors commented specifically on the lack of articulation agreements and the difficulty in getting industry's involvement in rural areas. Their suggestions for improvement included:

- Resolve scheduling conflicts.
- Raise the academic standards.
- Expand guidelines on how to apply for funds.
- Get all faculty on board.
- Make parents more aware of Tech-Prep.

Areas in need of assistance identified by site directors included:

- More coordination from the State Education Department.
- More funds.
- More information on other consortia because there is no need to "reinvent the wheel."
- Information on where the state is going with respect to Regents exams and where Tech-Prep fits into this.

A number of suggestions were made by local decision-makers regarding ways in which Tech-Prep could be improved. These suggestions included:

- Communication with the community should be improved. Suggested methods include: finding ways to improve communication between schools and businesses; soliciting the business community more actively to participate in Tech-Prep; establishing more contacts between schools and businesses; providing more publicity; letting the people know that the program is fantastic; and reaching more districts and more students.
- Communication between schools and programs should be improved. Methods suggested were: correlate the high school and college programs better with continuous dialogue and more training for the staff; School-to-Work program and Tech-Prep are duplications of each other, and they should work together instead of separately.
- Develop more resources; that is, provide more funds for Tech-Prep; develop a continuous commitment from the State for teacher training; provide necessary equipment; and expand the number of students for whom Tech-Prep is available.
- Additional areas concerning general improvements were: a need for more persistence and patience from the people involved in the program; a need for more flexibility from the Department of Labor; and inclusion in the Commissioner's statements on need for the development of multiple technical skills obtained through programs like Tech-Prep.

Future Areas of Emphasis:

At the conclusion of every interview, the interviewee was asked to make any additional comments regarding Tech-Prep that had not already been covered, especially areas needing emphasis. High school students comments reflected both positive and negative statements including the following:

- Tech-Prep is a feasible option to the Regents track.
- Tech-Prep demonstrates the utility of college.
- Counseling is key to Tech-Prep.
- Students need more counselors.
- One student commented on how Tech-Prep is perceived by other students by stating, *"Some kids thought it was special ed."*

High school teachers and post-secondary faculty's comments included the following:

- Without more funding, Tech-Prep will not be able to continue.
- Tech-Prep should not become a dumping ground for administrators to place general education students.
- Guidance counselors and admissions advisors should be more involved with students.
- The number of students involved in Tech-Prep should be increased.

High school guidance counselors stressed the following:

- *"A very enthusiastic and dedicated staff is the key."*
- A typical guidance counselor statement was: *"Tech-Prep is a terrific opportunity for students*

to succeed. We have many marginal students where we have huge successes academically and in terms of school adjustment."

Both high school guidance counselors and post-secondary admission/career counselors stressed:

- The need to resolve scheduling conflicts.
- The need to make parents more aware of Tech-Prep.
- The crucial role of integrating academic and vocational skills if Tech-Prep is to be successful.

High school administrators emphasized several issues:

- Tech-Prep should cut across all academic areas in content and in teaching methodology.
- Working with the business community is beneficial and needs to be continued.
- Students really benefit because they explore careers. Tech-Prep allows the middle group of students to aspire to college, and it prepares students for the future; this needs to continue and grow.
- Tech-Prep has opened up communication between schools and community colleges; this must continue.
- Tech-Prep's models and paradigms are far superior to traditional education; other programs should learn from them.

Other areas stressed by both high school and post-secondary administrators included:

- The need for continued use of businesses to provide students with opportunities to explore career options and to focus on career opportunities.
- Continuation of Tech-Prep as a means of encouraging more students to go to college.

THE PAIRS STUDY

Background & Introduction:

Existing legislation on Tech-Prep clearly outlines the program's structure and implementation guidelines. In the Tech-Prep Associate Degree model conceived in the Tech-Prep Education Act, Title IIIE of the Carl D. Perkins Vocational and Applied Technology Act of 1990, it is apparent that students who finish the program should obtain an associate degree or 2-year certificate, they should receive technical preparation in at least one field, and upon program completion be placed in, at least, entry level technical jobs or continue their education, or both. The federal law also encourages states to address drop-out prevention and the needs of special populations. However, because little is mentioned about the precise outcomes that should result for students who participate in and complete the program, outcome evaluation has been one of the most neglected components of Tech-Prep.[1]

[1] Bragg, D. D., Layton, J., & Hammons, F. (1994) Tech-Prep Implementation in the United States: Promising Trends and Lingering Challenges (MDS-714), Berkeley, CA: National Center for Research in Vocational Education (NCRVE), University of California at Berkeley.

A 1992 study conducted by Dornsife[1] established that evaluation-related activities carried out by local Tech-Prep programs focused primarily on documenting student enrollment and program completion at the secondary and post-secondary level. These activities were carried out primarily to demonstrate compliance with the Tech-Prep model.

In a brief review of 33 state evaluation activities, Bragg (1994)[2] confirmed that a few states were beginning to implement evaluations that would provide information about Tech-Prep student outcomes. In part, whether to initiate outcome evaluation was related to the fact that many of the four year Tech-Prep sequences were just coming on line. Nonetheless, many states had not established procedures when Tech-Prep programs were initiated in order to facilitate later outcome evaluations. In the State evaluations that were undertaken, a variety of research methods including transcript reviews, reviews of course materials, surveys of Tech-Prep students, and comparative studies involving analyses of differences between Tech-Prep and non-Tech-Prep students were implemented. In these comparative studies some significant differences between Tech-Prep and non-Tech-Prep participants were being detected. For example, in Illinois, data collected from transcripts, standardized tests and group interviews indicated that Tech-Prep students completed many more advanced science courses than those students who did not participate in Tech-Prep. The Tech-Prep students also scored significantly higher on the ACT than non-Tech-Prep students. In Rhode Island, findings showed that Tech-Prep students had higher grade point averages in math, science, and communications than students who did not participate in Tech-Prep. Participation in post-secondary education was also higher for Tech-Prep than for non-Tech-Prep students. None of the reports examined by Bragg, compared the implementation processes and effects across various settings such as rural, urban, or suburban locations and the non-Tech-Prep comparison students were not carefully matched to their Tech-Prep peers.

Research Questions:

The primary purpose of this study was to gain an understanding of Tech-Prep student outcomes across various settings and programs throughout the State of New York. The primary questions posed in this research were:

- How do the Tech-Prep participants compare to non-Tech-Prep students on factors relating to retention, motivation and attitude toward school?
- On key measures of academic performance, how do Tech-Prep participants perform compared to students who did not participate in Tech-Prep?
- On local and national academic achievement tests, at what levels do program participants achieve compared to their non-Tech-Prep peers?
- Are Tech-Prep participants more likely than their non-Tech-Prep peers to graduate from New York State public high schools with more competitive high school credentials in the form of Regents diplomas?
- Are Tech-Prep high school graduates more likely than their non-Tech-Prep peers to enroll in the paired two-year college within their Tech-Prep consortium? How do both groups compare in terms of college level performance?

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[1] Dornsife, C. (1992). Beyond Articulation: The Development of Tech-Prep Programs (MDS-311). Berkeley, CA: NCRVE, University of California at Berkeley.

[2] Bragg, D. D., Layton, J., & Hammons, F. (1994). op. cit.

At the secondary level, Tech-Prep programs tend to be located in large urban school districts and in suburban areas (Boesel, 1994)[1]. In New York State, approximately one-third of Tech-Prep consortia are also located in rural areas. Therefore, another primary question for this study was:

- Do student outcomes for Tech-Prep and non-Tech-Prep groups differ across regions and student population characteristics?

In New York, previous evaluations of Tech-Prep have focused on documenting local and state program implementation processes. For example, in the 1995 Tech-Prep Education Report[2] issued to the State Legislature, the authors provided great detail about the operation of Tech-Prep programs, the services offered to students, guidance counselors, and teachers, and the number of community and workforce linkages necessary to carry out the program. In that report, reference was made to the number of students enrolled in Tech-Prep, without discussing the educational and skills-related achievements of these students.

To date, only Delaware, Illinois, Rhode Island, and Ohio (Bragg, 1997)[3] have attempted to track Tech-Prep student outcomes using evaluation designs that are either longitudinal in nature or that involve the use of comparison groups. This study represents an initial effort within the State of New York to conduct an evaluation of Tech-Prep student outcomes. As in studies conducted in Rhode Island and Ohio, this evaluation employs a comparison group design for outcome measures. However, unlike the Rhode Island study where student survey data was collected, this study relies solely on information taken from high school and college transcripts of Tech-Prep and non-Tech- Prep students. As described below, this study also sought to develop the non-Tech-Prep comparison group through a matching process after which appropriate statistical techniques were further used to control for initial differences between Tech-Prep participants and non-participants. While this report presents initial data on high school and college outcomes for Tech-Prep students, it is hoped that this information will help New York build a foundation for future state-of-the-art evaluations of its Tech-Prep programs.

Methods

Conceptually and operationally Tech-Prep is a four year educational intervention. However, relatively few students in New York State have completed the full Tech-Prep sequence. Therefore, the Pairs Study needs to be framed as examining students en-route, or in various stages of completing a Tech-Prep program. Many of the "outcomes" reported in the study are measures taken after exposure to 1 year or 2 years of high school Tech-Prep. In fact, only approximately 14% of the Tech-Prep students assessed had completed one year of college or 75% of the intervention, and only 6 students in the sample have completed a full Tech-Prep sequence. Given this en-route examination of Tech-Prep, one needs to be cautious about concluding what the final or overall impact of the program will be.

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[1] Boesel, D., Rahn, M., & Deich, S. (1994). National Assessment of Vocational Education. Washington, DC: Office of Educational Research and Improvement, U.S. Department of Education.

[2] The University of the State of New York. (1995). Tech-Prep Education Report 1995. Albany, NY: New York State Education Department.

[3] Bragg, D. D. (1997). Educator, Student, and Employer Priorities For Tech-Prep Student Outcomes. Berkeley. CA: NCRVE, University of California at Berkeley.

Participating Consortia:

There were a total of 30 Tech-Prep consortia operating in New York State at the time of this study. The initial design envisioned three regional groups of Tech-Prep consortia, rural, urban and suburban, with seven consortia in each group. The three groups included the seven oldest consortia which had received implementation grants in the 1991-1992 academic year, all of which were initially included to maximize the longitudinal data. Two each of those were in rural and suburban areas, and three were in urban settings. Additional consortia were selected for each regional group by random assignment, bringing the initial total to 21 consortia with seven in each group. When Project Directors were informed that their consortia would be asked to participate in the study, one consortium declined. Later in the process five others were deleted for a variety of reasons, essentially due to incomplete or unusable data. The remaining Tech-Prep consortia were distributed with six each in the rural and urban groups and only three in the suburban group, a total of 15 participating consortia. Each of the participating consortium Project Directors were asked to designate a pair of institutions in their consortium -- one high school and a college which receives graduates from that high school. These 15 pairs constituted the participating institutions.

Matching Tech-Prep and Non-Tech-Prep Students:

Local Coordinators were asked to gather the high school transcripts of all Tech-Prep students who had attended that high school since program inception including those who had just begun 12th grade in Fall 1996. In addition, a cover sheet with demographic information was to be completed and attached to the transcripts. Students were to be identified by either social security number or other high school number and their names and addresses were to be deleted. When the Tech-Prep group records were in hand, the Local Coordinator was asked to assemble the same records from a group of non-Tech-Prep students from the same classes and years as the Tech-Prep students. They were instructed to make the non-Tech-Prep group at least half as large as the Tech-Prep group and to proportion the non-Tech-Prep group with approximately the same distribution by gender and match the Tech-Prep group with one academic measure such as ninth grade average or a math grade or score which was commonly available. Following the formation and record gathering for the two groups, the Local Coordinator was then asked to determine which students in both groups attended the paired college and to secure college transcripts and status information.

For each Tech-Prep student whose records were received, the following information from the high school and college records, where available, were coded for input into a statistical package: consortium identification number, high school student identification number, college student identification number (if different), gender, Tech-Prep status, high school status, minority group status, special population status, diploma type received, number of years for high school graduation, year of high school graduating class, cumulative total number of Tech-Prep courses taken and number passed in 9th & 10th grades, cumulative total number of Tech-Prep courses taken and number passed through the 11th grade, and likewise through the twelfth grade, 9th grade high school average, 10th grade high school average, 11th grade high school average, 12th grade high school average, cumulative high school average at graduation, Regents Competency Math Test score on first and second tries, Regent Competency Math Test pass or fail on first or second tries, Regents Competency Science Test score on

first and second tries, Regents Competency Science Test pass or fail on first or second tries, Regents Sequential Math I test score on first and second tries, likewise Regents Sequential Math II test scores, Regents Earth Science test scores, and Regents Biology test scores, PSAT Verbal score, PSAT Math score, SAT Verbal score on first and second tries, SAT Math score on first and second tries, cumulative number of absences in 9th and 10th grades, cumulative number of absences through 11th grade, cumulative number of absences through 12th grade, college status, first college curriculum area, whether curriculum matches the high school Tech-Prep program emphasis, whether remediation was required in college and in which subject areas, whether student changed curriculum, first full semester grade-point average (GPA), likewise second full semester GPA, third semester GPA, fourth semester GPA, cumulative GPA at college graduation, and type of degree awarded. The instructions for coding and the coding form are shown in Appendix P-A.

This evaluation is retrospective, in that student data was obtained from student transcripts and other demographic information and the matching of Tech-Prep and non-Tech-Prep students was likewise done on a retrospective basis. It also depended to a large extent on the ability of the Local Coordinators to access all necessary student records and provide complete reports. Furthermore, the formation of the non-Tech-Prep high school groups were evidently more difficult to achieve with the desired proportions, as noted above. In several instances, local officials were reluctant to permit access to student records in spite of assurances of absolute confidentiality and a letter from the State Education Department requesting cooperation with the study. Some Local Coordinators had to change to a different high school where records were more easily accessed. Notwithstanding these difficulties as reviewed below and presented in Table P-1, the matching was surprisingly well done by the Local Coordinators.

Population and Sampling:

Data were received for 2,309 students. However, information from several consortia were discarded because of incomplete or inappropriate data. Students who had been identified as having special needs, such as Limited English Proficiency (LEP) and Special Education, were analyzed separately from the sample of students enrolled in regular academic tracks because their grades were not developed on a comparable basis to other students. The Special Education group totaled only 20 students which was too small a group to analyze statistically. The LEP group totaled 66 students and a separate analysis was performed for that student group. Table P-1 shows that the final sample of students used in the general analyses consisted of 1,050 Tech-Prep participants and 804 non-participants; 1,070 were male, 784 were female, and 916 were identified as coming from white ethnic backgrounds, while 938 were identified as members of various "minority" groups. Across the two comparison groups, there were significant differences in the proportion of males (60% and 55%) and females (40% and 45%) ($\chi^2 = 5.63$, $p = .02$) and in the proportion of minority (53%) versus non-minority (47%) students ($\chi^2 = 4.16$, $p = .04$) represented in each group. In the high school and college pairs participating in this study, Tech-Prep programs appear to draw a majority of male and non-white students. The high concentration of non-whites within these pairs may be associated with the fact that most of the students included in this study were drawn from urban programs. These numbers may, however, not be representative of the population served by all 30 consortia throughout the State of New York.

TABLE P-1

DEMOGRAPHIC CHARACTERISTICS OF STUDY PARTICIPANTS

Region of State	Tech-Prep Students (N = 1,050)	Non-Tech-Prep Students (N = 804)
Rural	21% (222)	21% (167)
Urban	75% (788)	75% (602)
Suburban	4% (40)	4% (35)
Gender		
Male	60% (631)	55% (439)
Female	40% (419)	45% (365)
Ethnic Background		
White	47% (497)	52% (419)
African-American	35% (370)	34% (272)
Hispanic	13% (136)	12% (100)
American Indian	< 1% (1)	< 1% (1)
Asian	4% (41)	1% (11)
Other	< 1% (5)	< 1% (1)
Year of High School Graduation		
1992	2% (24)	2% (13)
1993	3% (26)	3% (26)
1994	20% (206)	20% (159)
1995	29% (304)	26% (212)
1996	27% (281)	28% (223)
1997	19% (203)	21% (170)

Results

High School Performance:

One of the first questions addressed in this study was whether participation in Tech-Prep is associated with academic behaviors, such as school performance, attendance, and increases in achievement on standardized test taken by high school students. Scores (unadjusted means) of Tech-Prep and non-Tech-Prep students on each of the variables of interest are presented in Table P-2.

Certainly, students' grades and scores on achievement tests are influenced by a variety of factors including, previous academic achievement, background characteristics, and characteristics of the schools students attend. The primary issue for Tech-Prep evaluators is to understand the specific contribution that Tech-Prep makes to students' learning and achievement. In this study, multiple regression techniques were used to address questions regarding the unique contribution of Tech-Prep to student outcomes, detailed in Table P-2. Separate analyses were conducted on a series of outcome variables: (a) high school averages in the 11th and 12th grades; (b) cumulative high school averages; (c) number of absences during the 11th and 12th grades; and, (d) scores obtained on a variety of statewide and national examinations including, the New York State Sequential Math I, Sequential Math II, Earth Science, and Biology Regents exams; and the verbal and mathematics sections of the PSAT and Scholastic Aptitude Test (SAT). Results of these analyses are presented in Table P-3 (The construction of the regression models is explained in Appendix P-B). As indicated in Table P-3, Tech-Prep makes statistically significant contributions to students' high school averages, and the number of absences during the 11th and 12th grades.

Notwithstanding the matching process used to construct the Tech-Prep and non-Tech-Prep groups, students who enrolled in Tech-Prep programs had pre-program 10th grade averages that were significantly higher than those of students who did not choose to participate in Tech-Prep (M = 75.57 for Tech-Prep versus 72.88 for non-participants). In 10th grade, the year before students made decisions whether or not to participate in their school's program, Tech-Prep students had averages that were 2.69 points higher than that of students who did not enroll in the Tech-Prep curriculum. However, even after statistically equating the groups using 9th and 10th grade averages, Tech-Prep students continued to have higher grades in the 11th and 12th grades. As can be seen in Table P-2, without adjusting for students' 9th and 10th grade averages, Tech-Prep students appear to have 11th grade averages that are 2.64 points higher than that of non-Tech-Prep students. However, the results of regression analyses presented in Table P-3 which control for differences in 9th and 10th grade averages, indicate that a statistically significant portion of this difference can be attributed to Tech-Prep participation. In the 11th grade, participation in Tech-Prep contributed an additional .82 points to program participants' average. In the 12th grade, participation in Tech-Prep was associated with a .52 gain in the average of Tech-Prep students. By the end of 12th grade, Tech-Prep had contributed approximately .79 points to Tech- Prep students' averages. While these adjusted mean differences may appear small, they represent the absolute contribution of Tech-Prep to students' grades. That is, they provide an indication of what participation in Tech-Prep contributes to students' averages after controlling for other individual characteristics of students that also impact school performance (see Appendix P-B for further details).

TABLE P-2

UNADJUSTED MEANS FOR TECH-PREP & NON-TECH-PREP STUDENTS ON HIGH SCHOOL OUTCOME VARIABLES

	Tech Prep Students		Non-Tech Prep Students	
Outcome Variables	**M**	**SD**	**M**	**SD**
11th Grade HS Average	76.24	9.27	73.60	10.27
12th Grade HS Average	77.97	8.13	75.62	9.61
Cumulative 12th Grade HS Average	77.82	6.59	75.29	7.66
Absences During Grades 11 and 12	23.30	21.45	41.31	40.56
Sequential Math I Regents Test Score	68.58	18.41	66.98	20.53
Sequential Math II Regents Test Score	66.47	20.18	69.68	19.54
Earth Science Regents Test Score	70.61	12.60	70.21	13.92
Biology Regents Test Score	69.38	14.06	68.63	15.20
PSAT Verbal Scores#	42.85	8.80	48.43	42.74
PSAT Math Scores#	46.04	8.84	49.16	29.78
SAT Verbal Scores#	443.71	97.73	455.80	88.42
SAT Math Scores#	461.86	86.92	485	94.33

PSAT and SAT scores were recentered during the period of this study. However, it has been assumed that the recentering affected the Tech-Prep and non-Tech-Prep groups equally.

TABLE P-3

EFFECTS OF TECH-PREP PROGRAM

Outcome Variables	Regression Coefficient	Significance Level
11th Grade HS Average	.82	.04*
12th Grade HS Average	.52	.04*
Cumulative HS Average	.79	.04*
Absences During Grades 11 and 12	-8.14	.00*
Sequential Math I Regents Test Score	.31	.74
Sequential Math II Regents Test Score	-2.19	.04*
Earth Science Regents Test Score	.37	.65
Biology Regents Test Score	-.06	.94
PSAT Verbal Scores#	-2.57	.67
PSAT Math Scores#	-.91	.83
SAT Verbal Scores#	-4.61	.74
SAT Math Scores#	-15.64	.22

* Indicates significance at the .05 level
# See footnote in Table P-2

Significant differences were also found in students' high school attendance. In general, during the 11th and 12th grades, Tech-Prep students were absent from school 18 days less than their non-Tech-Prep peers. Again, regression analyses indicate that a significant proportion of this difference can be attributed to the effects of Tech-Prep. As seen in Table P-3 participation in Tech-Prep reduced school absences by an adjusted mean difference of 8 days.

As can be seen in Table P-2, Tech-Prep students also had scores on two New York State Regents examinations that were higher than the scores obtained by non-Tech-Prep students. Tech-Prep students also scored lower than their peers on the Scholastic Aptitude Tests and other Regents examinations. Based on the multiple regression analyses, however (Table P-3), many of these differences were not statistically significant. The only statistically significant difference was associated with performance on the Sequential Math II Regents exam. On this exam, Tech- Prep students scored an average of 2.19 points lower than their non-Tech-Prep peers.

Students in New York State who don't take the more rigorous Regents exams must sit for Regents Competency Tests (RCT's). Tech-Prep students were more likely than their non-Tech-Prep peers to pass these competency tests in mathematics ($\chi^2 = 13.65$, $p = .00$) and in science ($\chi^2 = 7.57$, $p = .00$). In general, students enrolled in high schools located in urban areas were more likely than students from all other regions to successfully complete Regents Competency Tests (RCTs) in mathematics ($\chi^2 = 31.74$, $p = .00$) and in science ($\chi^2 = 24.98$, $p = .00$). Tables P-4 and P-5 show the numbers and percentages of students passing the math and science RCTs.

The strength of Tech-Prep's contribution to students' achievements on each of the significant variables -- absences, high school average, and Math II Regents exam, etc. -- varied across each of 15 consortia for which sufficient data was available to allow for separate analyses (see Table P-6). In order to understand whether these variations in the magnitude of the effects of Tech-Prep were associated with either differences in Tech-Prep site characteristics, region, or time of implementation, the findings from the individual sites were subjected to meta-analytic procedures.

Meta-analysis procedures allow investigators to compare the differences detected in various studies or in various settings and to detect whether these differences can be attributed to any particular program characteristic. For this study, the individual regression coefficients were compared across sites, regions, and levels of implementation (years the program has been in operation). The results of this meta-analytic technique indicated that differences across sites, regions, and programs with varying years of implementation are not statistically significant. This suggests, that the findings described above may be generally stable across the different New York State Tech-Prep consortia in this study (or that no particular outcome findings are associated with the program characteristics examined).

<u>High School Completion and Post-Secondary Enrollment</u>:

Tech-Prep students were more likely than their peers to graduate from high school within 4 years ($\chi^2 = 33.82$, $p = .00$). Whereas 96.6% of all Tech-Prep participants graduated high school within four years, only 89.6% of the students enrolled in other types of curricula did so within the same time period.

TABLE P-4

PERFORMANCE OF TECH-PREP & NON-TECH-PREP STUDENTS ON RCT MATH TEST

	Number Of Students Passing	Number Of Students Not Passing
Tech-Prep Students		
Rural	13% (81)	< 1% (3)
Urban	72% (465)	9% (60)
Suburban	5% (34)	<1% (2)
	90%	10%
Non-Tech-Prep Students		
Rural	10% (55)	<1% (2)
Urban	67% (358)	17% (89)
Suburban	5% (28)	< 1% (2)
	82%	18%

TABLE P-5

PERFORMANCE OF TECH-PREP & NON-TECH-PREP STUDENTS ON RCT SCIENCE TEST

	Number Of Students Passing	Number Of Students Not Passing
Tech-Prep Students		
Rural	12% (78)	1% (5)
Urban	70% (444)	11% (68)
Suburban	6% (37)	<1% (1)
	88%	12%
Non-Tech-Prep Students		
Rural	11% (59)	<1% (3)
Urban	66% (355)	17% (89)
Suburban	5% (29)	<1 % (1)
	82%	18%

TABLE P-6

STRENGTH OF DIFFERENCES IN OUTCOME VARIABLES ACROSS 15 CONSORTIA

Consortia	Outcome Variables													
	Cum Average		Absences		Math I		Math II		Earth Sci		Biology		SAT Verb		SAT Math	
	Coeff	p	Coeff	p	Coeff	p	Coeff	p	Coeff	p	Coeff	p	Coeff	p	Coeff	p
Rural																
1	-2.80	.01	-0.21	.95	-4.89	.49	2.59	.72	-6.72	.10	-2.70	.62	-6.63	.93	-132.04	.11
2	1.27	.25	2.58	.52	-3.14	.52	4.24	.40	0.97	.72	-4.45	.06	-11.58	.65	8.38	.78
3	3.16	.21	-8.27	.22	4.62	.39	-8.32	.14	-9.04	.04	-6.31	.40	33.38	.32	0.33	.99
4	-0.04	.98	4.87	.38	-5.89	.10	-1.03	.84	0.99	.61	-2.00	.36	14.95	.66	-11.14	.63
5	-2.66	.21	NA	NA	-1.60	.73	-3.93	.52	-3.17	.38	-5.49	.12	-235.35	.03	-121.19	.26
6	-0.85	.70	7.76	.21	-1.58	.66	-2.76	.52	-1.74	.52	-3.96	.22	-20.11	.57	-12.86	.70
Urban																
7	0.34	.92	-7.80	.46	-51.91	.02	1.66	.99	-17.75	.09	-15.91	.22	24.21	.80	-85.39	.26
8	2.91	.00	-13.14	.01	-1.15	.59	-2.01	.41	3.59	.16	1.62	.30	NA	NA	NA	NA
9	2.31	.24	-14.25	.32	-0.54	.89	1.02	.81	-0.53	.89	-5.73	.20	NA	NA	NA	NA
10	1.13	.72	-6.04	.27	-1.28	.74	-4.78	.10	-2.77	.28	-1.39	.60	NA	NA	NA	NA
11	1.58	.04	-12.56	.11	5.91	.01	-1.64	.57	8.40	.11	0.40	.94	NA	NA	NA	NA
12	-2.80	.75	NA	NA	-0.56	.76	1.58	.44	1.04	.50	0.88	.67	NA	NA	NA	NA
Suburban																
13	-0.44	.84	NA	NA	1.52	.68	-4.48	.55	-1.73	.48	1.69	.71	NA	NA	NA	NA
14	2.97	.34	-19.44	.17	1.34	.94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	NA	NA	NA	NA	4.01	.55	-6.62	.71	-7.34	.22	-4.52	.49	NA	NA	NA	NA

74

NA = Insufficient data for calculation

75

In New York State, upon graduation, high school students may obtain either a diploma issued by the Board of Regents or one issued by their local high school. To obtain a Regents diploma, high school students must successfully complete more rigorous course work and pass a specific series of the New York State Regents exams. The decision to obtain either a Regents or a local diploma is usually made by the student and may be related to the focus of the Tech-Prep program and the students' academic goals. Hence, another question that could be explored is whether Tech-Prep students are more likely to obtain a Regents diploma or a local one.

Hierarchical log linear analyses suggest that the answer to this question is complex. As can be seen in Table P-7, Tech-Prep students, in general, are not more likely than their non-Tech-Prep peers to obtain a Regents diploma. Rather, among the students included in this study, it was students from urban areas enrolled in Tech-Prep who received the highest proportion of Regents diplomas (χ^2 = 26.02, p =.00). This finding suggests that there might be variations across Tech-Prep programs that need to be furthered explored. However, this finding must be interpreted with some caution. There are broader over-arching educational policies implemented within the City of New York that may be impacting the rate with which students, in general, receive Regents diplomas. For example, the Schools Chancellor in the City of New York now requires all students to complete Regents examinations regardless of the academic program in which they are enrolled.

TABLE P-7

TYPE OF HIGH SCHOOL DIPLOMA RECEIVED BY TECH-PREP AND NON-TECH-PREP STUDENTS

	Regents Diploma	Local Diploma
Tech-Prep Students		
Rural	5% (38)	18% (145)
Urban	15% (123)	60% (493)
Suburban	< 1% (2)	2% (15)
	20%	80%
Non-Tech-Prep Students		
Rural	9% (54)	14% (83)
Urban	10% (61)	64% (383)
Suburban	1% (9)	2% (10)
	20%	80%

College Performance:

A key question that many evaluations of Tech-Prep have not fully addressed as yet is: What happens to Tech-Prep students after they graduate from high school? In an initial step towards answering this question, available college transcripts of Tech-Prep high school graduates were examined. Of particular interest to the investigators were college retention and students' performance

while in college. However, because information was provided only for students who had enrolled in the college that had formed a formal partnership and articulation agreement with the students' high school, data collected to address these two issues are limited. This information still provides some clues about students' post-high school outcomes and generates ideas for future research.

College transcript data were available from paired community colleges for 330 of the high school graduates. Among this sample, 208 were Tech-Prep participants and 122 had not participated in Tech-Prep. Twenty-two percent of these students had received a Regents diploma upon graduating from high school. The remaining 78% received local diplomas.

Analyses were completed using data for those students who had received local diplomas and were enrolled in colleges associated with Tech-Prep partnerships. Among this group of 240 students, 66% (159) were Tech-Prep participants and 34% (81) were non-Tech-Prep participants. Whereas 70% of the Tech Prep students remained in or graduated from college at the time of this study, slightly fewer (65%) of non-Tech-Prep students remained. Hierarchical loglinear analyses suggest, however, that these differences are not statistically significant (see Table P-8).

For these two college cohorts, Tech-Prep students performed better than their peers. By the end of the second semester or first year of college Tech-Prep students had GPAs (M =2.33) that were significantly higher than that of non-Tech-Prep students (M = 1.28; ($F(1,61) = 13.91$, $p = .00$). The small number of non-Tech-Prep students included in the third and fourth semester samples preclude analyses of potential differences in third and second semester college grades (see Table P-9).

With regard to students who graduated with a Regents diploma, a more complicated picture emerged (see Tables P-10 & P-11). A higher proportion of Tech-Prep students dropped out of college and Tech-Prep students had lower first year GPA's but seem to have had higher GPA's after two years.

TABLE P-8

COLLEGE STATUS OF TECH-PREP & NON-TECH-PREP STUDENTS WHO RECEIVED LOCAL HIGH SCHOOL DIPLOMAS

	Currently Enrolled Or Graduated	Dropped Out
Tech-Prep Students		
Rural	14% (22)	5% (9)
Urban	50% (79)	24% (39)
Suburban	5% (8)	1% (2)
	70%	30%
Non-Tech-Prep Students		
Rural	8% (7)	3 % (2)
Urban	52% (42)	31% (25)
Suburban	5% (4)	1% (1)
	65%	35%

TABLE P-9

MEANS FOR LOCAL DIPLOMA TECH-PREP & NON-TECH-PREP STUDENTS ON COLLEGE OUTCOME VARIABLES

Outcome Variables	Tech-Prep Students	Non-Tech-Prep Students
Semester 1 Grade Point Average	2.27 (N = 73)	1.18 (N = 23)
Semester 2 Grade Point Average	2.33 (N = 49)	1.28 (N = 14)
Semester 3 Grade Point Average	2.31 (N = 21)	1.10 (N = 5)
Semester 4 Grade Point Average	2.52 (N = 19)	1.17 (N = 2)

TABLE P-10

COLLEGE STATUS OF TECH-PREP & NON-TECH-PREP STUDENTS WHO RECEIVED REGENTS HIGH SCHOOL DIPLOMAS

	Currently Enrolled Or Graduated	Dropped Out
Tech-Prep Students		
Rural	18% (8)	2% (1)
Urban	36% (16)	39% (17)
Suburban	5% (2)	0% (0)
	59%	41%
Non-Tech-Prep Students		
Rural	35% (14)	0% (0)
Urban	22% (9)	30% (12)
Suburban	8% (3)	5% (2)
	65%	35%

TABLE P-11

MEANS FOR REGENTS DIPLOMA TECH-PREP & NON-TECH-PREP STUDENTS ON COLLEGE OUTCOME VARIABLES

Outcome Variables	Tech-Prep Students	Non-Tech-Prep Students
Semester 1 Grade Point Average	2.60 (n = 31)	2.90 (n = 24)
Semester 2 Grade Point Average	2.30 (n = 49)	2.70 (n = 19)
Semester 3 Grade Point Average	2.45 (n = 9)	3.10 (n = 10)
Semester 4 Grade Point Average	2.78 (n = 5)	2.38 (n = 7)

Findings For Limited English Proficient Students:

Data on Limited English Proficient (LEP) (n = 66) and Special Education (n = 20) were available for only 86 students. This small number of students suggests that these populations are not being served with great frequency by the Tech-Prep programs included in this study.

Due to the small sample size, separate analyses were conducted only with data obtained from students identified as Limited English Proficient (LEP). Among the 66 students included in this sample, 41 were enrolled in Tech-Prep and 25 did not participate in Tech-Prep. Because of the small number of cases and large amount of missing data, we were unable to use the same analytical techniques -- regression analyses -- that were employed in the results presented above for Tech-Prep students from the regular academic tracks. Instead, one-way analysis of variance was used to investigate the strength of the differences between the GPA, absences, and test score unadjusted means of Tech-Prep versus non-Tech-Prep LEP students. As can be seen in Table P-12, the pattern of differences between Tech-Prep and non-Tech-Prep LEP students paralleled differences found for students drawn from the regular academic tracks. LEP students enrolled in Tech-Prep had 12th grade and cumulative high school grade point averages that were higher than those of their non-Tech-Prep peers. Tech-Prep LEP also had fewer absences in grades 11 and 12 than did their non-Tech-Prep peers. These differences, however were not statistically significant.

From among the sample of LEP students, a small but equal number of Tech-Prep (6) and non-Tech-Prep (6) students had enrolled and remained in college at the time of the study. Insufficient data, however, prevents us from reaching any conclusions about the impact of Tech-Prep on LEP students' college attendance and performance.

TABLE P-12

UNADJUSTED MEANS FOR LEP TECH-PREP & NON-TECH-PREP STUDENTS ON HIGH SCHOOL OUTCOME VARIABLES

	Tech Prep Students		Non-Tech Prep Students	
Outcome Variable	M	SD	M	SD
11th Grade HS Average	76.27	12.93	72.21	8.78
12th Grade HS Average	75.54	7.60	75.79	9.70
Cumulative 12th Grade HS Average	75.87	6.58	75.71	6.06
Absences During Grades 11 and 12	45.50	32.87	48.00	28.23
Sequential Math I Regents Test Score	64.16	18.87	68.00	19.96
Sequential Math II Regents Test Score	61.06	22.61	72.43	23.39
Earth Science Regents Test Score	66.00	11.85	56.50	14.85
Biology Regents Test Score	63.29	13.79	75.00	11.31
PSAT Verbal Scores	NA	NA	NA	NA
PSAT Math Scores	NA	NA	NA	NA
SAT Verbal Scores	NA	NA	NA	NA
SAT Math Scores	NA	NA	NA	NA

NA--No comparisons made; fewer than 2 students in each group completed the exam.

Discussion

The primary purpose of this study was to investigate the impact of Tech-Prep participation on students' school-related behaviors, academic achievement, and college performance. The retrospective nature of the Tech-Prep and non-Tech-Prep sample matching and the small number of data available for some variables limit how much can be said about the impact of New York's Tech-Prep programs. However, there are some significant and suggestive trends in the data that require further exploration.

The high school data suggest that Tech-Prep students attend school more often and also achieve higher grade point averages than their peers. One plausible explanation of these data is that the Tech-Prep programs are successful in maintaining students' interest in school. Conceivably, because Tech-Prep students enroll in courses where academic skills are taught through practical application and course work is linked to future employment, they may be more motivated than their non-Tech-Prep peers to attend school. It is this higher attendance among Tech-Prep students that may be most closely associated with their higher grade averages since high school grade average reflects a direct measure of what students have been taught in the classroom.

Significant Regents, PSAT, and SAT test score gains were not evident among Tech-Prep students. This may be attributed to the fact that unlike grades, test scores focus on traditional academic content and may not be sensitive to the specialized curriculum that Tech-Prep students receive. It is interesting to note, however, that even when students complete competitive examinations, such as the RCTs, Tech-Prep participants successfully pass these exams more frequently than do non-Tech-Prep participants.

A very limited amount of data related to students' post secondary achievements was available for this study. Conclusions based on these data are, therefore, suggestive rather than definitive. In all, the college data suggest that enrollment in Tech-Prep may be related, not only to persistence in high school, but also in college. Tech-Prep students remain motivated to complete and do well in college courses; they receive higher grades than their non-Tech-Prep peers during their first year in college. Perhaps this apparent persistence stems from the career focus, guidance, and integrated academic and vocational curriculum that make clear to students what the linkages are between school and work.

Data on college outcomes also suggest that there may be some persisting effects of Tech-Prep participation that carry over and are magnified in the college years. For example, differences between Tech-Prep and non-Tech-Prep students' high school outcomes, although significant, were not dramatic. When Tech-Prep students with credentials similar to non-Tech-Prep participants (e.g., graduates with local high school diploma) enter college, Tech-Prep students appear to surpass non-participants. Could it be that Tech-Prep has it's greatest effects in the years following high school graduation? If we are to answer this question, then greater effort should be given to documenting students' post-secondary outcomes. Tech-Prep has been implemented in New York since the 1991-1992 academic year. It is only now that Tech-Prep students are beginning to graduate from two-year colleges with associate degrees since most students require three years on average to complete those degree programs. Future studies should, therefore, focus on tracking the college and occupational outcomes of these students. It is only by looking at students who receive the full Tech-Prep "treatment" that we will be able to arrive at definitive conclusions about the function and impact of Tech-Prep on students' lives.

THE BEST PRACTICES STUDY

Purpose, Plan & Outcomes:

As part of the State-wide evaluation, the Tech-Prep Technical Assistance Center at CASE asked the directors of each consortium to explore the various components and themes in their consortium to find especially innovative and outstanding practices that they felt should be announced to a broad audience. The purpose of this endeavor was to share practices of high quality or creativity which have been put into operation in Tech-Prep programs and have had a positive impact on students or some other important aspect of the program.

Consortium directors reported practices that were found to be effective in:

- Preparing students for college and the workforce
- Curriculum development, advisement, and counseling
- Marketing of Tech-Prep programs and recruitment of students
- Promoting and maintaining close collaboration between secondary and post-secondary Tech-Prep faculty and counselors
- Building partnerships with industry
- Fostering administrative support and leadership
- Securing the involvement of local government and community groups
- Enhancing program funding
- Developing coordinated programs with School-To-Work partnerships.

This effort produced a total of 97 individual practices received from 28 of the 30 State consortia. These practices have been classified for convenient reference in the categories shown in Table B-1.

TABLE B-1

BEST PRACTICES CATEGORIES

Category	Number of Practices
Focus on Students	34
Immediate Interest to Faculty	28
Applications to Administrative Matters	8
Combinations of Those Above	
Students & Faculty	14
Students & Administrative	3
Faculty & Administrative	4
All Three Categories	6
Total	97

List of Titles of Best Practices:

The titles of all 97 practices are listed below within the categories previously noted.

- Practices with a primary focus on Students (34 Practices)

Advanced Placement College Credit While in High School
Allied Health
Applied Academics at LINKS Alternative School
Applied Math Program for 8th Graders at Downsville
Bridge Courses
Career Camp
Career Connections
Career Exploration Internship Program at Gilboa
College Placement Assessment
College Proficiency Testing Project for Tech-Prep Students
Equine Racing Management Program
Field Experience for Delaware Academy Students
Improving Motivation of At-Risk & Other Students Toward School
Increasing Retention in High School and Moving on to College
Interdisciplinary Portfolio Assessment for 12th Grade Fashion Technology Curriculum
Job Shadowing
Job Shadowing & Collaborative School/Business Partnership
Keeping At-Risk Students in School Through Experience-Based Education
L.A.B.O.R. --Learning About Better Opportunities Responsibly
Mohonasen High School Career Majors
Nontraditional Role Model Career Days
Providing Effective Work-Place Learning Experiences
Research a Health Care Facility in Your Community
Serving the "At-Risk" Student Successfully
Shadowing Program in Technical & Academic Communication at VVS
Student Orientation to Tech-Prep and College Life
Summer Internship
Teaching and Learning Based on Cognitive-Analytic Strategy
Teamwork in Principles of Technology
Tech-Prep Physics: An Inclusive Model
Tech-Prep Testing
12th Grade Language Arts Unit
Use of Technology
Workplace Learning -- Internship

- Practices of immediate interest to high school and/or college Faculty (28 Practices)

Curriculum Development
DACUM Competency Profile
Developing a Comprehensive Career & Advisement Counseling Program
Developing Innovative Marketing and/or Recruitment Plans

Developing a Model of Excellence of Integrated Technical & Academic Curriculum Development
Ergonomics at Warsaw High School
A Hospital-Based School-To-Work Model
Improvement of High School Academic Performance
Instructional Materials Development Program Emphasizes SCANS Outcomes
Integrating Academic & Technical Education at the Two-Year College Campus
Math/Science/Technology Course as Model for Additional Tech-Prep Courses
Monthly Career & Personal Development Seminars at the Community College
MST/Careers Activities for Tech-Prep Pre-Engineering
Multi-Year Recruitment Process
Planning a Business Conference
Pre-Freshman Transition Courses
Professional Staff Development in Cognitive-Analytic (Whole Teaching-Whole Learning) Strategy
Program Enhancements in Applied Math at Worcester Central School
Providing Effective Professional Staff Development Activities/Programs
Share Groups
Success Leads to Motivation
Teachers Communicating Effective Teaching Techniques
Teacher's Role as Facilitator During Group Interaction in Math
Tech-Prep Day
Tech-Prep GURU
Tech Wars
Using Problem-Solving Strategies
Windows to the World -- Doorways to the Future

- Practices with direct application to Administrative matters (8 Practices)

Block Scheduling at New Berlin
Computer-Aided Drafting and Design Program
Forums
Industry Fundraising
Marketing Approaches
Marketing Tech-Prep to 10th Grade Students
Parent and Teacher Involvement in Tech-Prep at GMU
Student Management

- Practices which are Combinations of the other three categories (27 Practices)

    - 14 are Combinations of Students & Faculty categories

Applied Physics/Principles of Engineering
Automation Robotics/English 11B/Tech Course
Basic Technical Drawing
Company Simulations
CORD Math I Successes at Cherry Valley-Springfield

Global Studies -- A Tech-Prep Perspective
GLOW Job Shadow Process
Improving the Number and Proportion of Students Admitted to College
Mission Possible! At Quaker Publishing
The Paid Industry Experience -- Communication = Success
Reducing the Need for Remediation in College
Reducing the Need for Remediation in College
Using the Graphing Calculator for a Food Packaging Problem
Work Experience for Business Students

- 3 are Combinations of Students & Administrative categories

Little Apple -- A Student-Run Business
Manufacturing Career Awareness Program
Workforce Development System

- 4 are Combinations of Faculty & Administrative categories

Business/Industry Collaboration in Tech-Prep Curriculum & Program Development
Coordinating Professional Development with School-To-Work Programs
Communication
Tech-Prep Recruitment and Promotion

- 6 are Combinations of all the Other Three categories.

Dresser-Rand/Tech-Prep Project
High School-College Collaboration for Internships
Making it Happen! Introducing Students to the Workplace
Massena Tech-Prep/School-To-Work Partnership
Reducing the Need for Remediation in College Through Curriculum Development
School-To-Work Assistance Program at Oneida High School

Each of these practices is briefly described on a single page in Appendix B-A, together with the names and numbers of the contact persons. The persons listed for each practice are directly involved in the activity and will welcome inquiries for further information.

APPENDIXES

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APPENDIX S-A

SURVEY METHODOLOGY & RESPONDENTS

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TABLE S-A-1

LISTS OF CONSORTIA & TYPES OF SURVEYS DISTRIBUTED

Consortia	Consortia Director	High School	Special Needs	Post-Secondary
Bronx Community College	X	X		X
Broome Community College	X	X	X	X
Cattaraugus-Allegany BOCES	X	X	X	X
Corning Community College	X	X		X
Dutchess/Ulster Tech-Prep Consortium	X	X	X	X
Eastern Suffolk BOCES	X	X		X
Erie I BOCES	X	X		X
Fashion Institute of Technology	X	X		X
Finger Lakes Community College	X	X	X	X
Genesee Community College	X	X		X
Monroe Community College	X	X	X	X
Mount Vernon City School District	X	X	X	X
Nassau BOCES	X	X		X
College of Staten Island	X	X	X	X
New York City Technical College	X	X		X
Niagara County Community College	X	X		X
Onondaga Community College	X	X		X
Orange County Community College	X	X		X
Oneida-Madison BOCES	X	X		X
Putnam/No. Westchester BOCES	X	X		X
Queensborough Community College	X	X		X
St. Lawrence-Lewis BOCES	X	X		X
SUNY College of Technology at Alfred	X	X	X	X
SUNY ATC at Cobleskill	X	X	X	X
SUNY College of Technology at Delhi	X	X	X	X
Syracuse City School District	X	X		X
Tompkins-Cortland Community College	X	X	X	X
Two Year College Development Center	X	X	X	X
Western Suffolk BOCES	X	X		X
Yonkers City School District	X	X		X

GENERAL INFORMATION ABOUT SURVEY RESPONDENTS

In this section, the general demographic data on each survey respondent (high school students, students with special needs, high school teachers, high school administrators, high school guidance counselors, post-secondary students, post-secondary faculty, post-secondary administrators, post-secondary career counselors) are presented.

High School Students

A total of 865 high school students responded to the paper and pencil survey. Fifty-three percent (53%) were male and 47% were female. The mean age was 16.6. The distribution in each grade was: 7% Grade 9, 10% Grade 10, 36% Grade 11, and 48% Grade 12. Fifty-three percent (53%) of students said that they were in Regents program; 47% were not.

The distribution of Tech-Prep programs in which students were enrolled is as follows;

TABLE S-A-2

TYPE OF TECH-PREP PROGRAM IN WHICH STUDENTS ARE ENROLLED

Type Of Program	%
Engineering Technology	50
Health/Human services	18
Business/Office/Marketing	15
Mechanical/Industrial Trade	5
Arts/Humanities	2
Agriculture	1
Other	9

The distribution of Tech-Prep courses in which students are currently enrolled is as follows;

TABLE S-A-3

TYPE OF COURSES WHICH STUDENTS WERE TAKING

Type Of Courses	%
Engineering Technology	43
Business/Office/Marketing	23
Arts/Humanities	19
Health/Human services	13
Career Planing/Preparation	7
Mathematics	3
Mechanical/Industrial Trade	2
Agriculture	2
Other	1

High School Students With Special Needs:

Sixty-eight (68) students responded the separate survey for students with special needs. Fifty-seven percent (57%) were male and 43% were female. The average age was 16.5 years old. More than half of them reported that they were in Tech-Prep program related to engineering technology. Forty-four percent (44%) of them were taking a course in mathematics, 31% in engineering technology, 21% in arts/humanities, with the remainder in career planning, and business/office/marketing. Eleven percent (11%) of students indicated that they had an identified disability.

Post-secondary Students:

Fifty-seven (57) post-secondary students answered the survey. Forty-three percent (43%) were female and 57% were male. Average age was 19.5. The eldest student was 45 years old while the youngest was 17 years old. Their areas of college concentration can be seen in Table S-A-4.

TABLE S-A-4

STUDENTS' AREAS OF CONCENTRATION IN COLLEGE

Area Of Concentration	%
Engineering Technology	31
Health/Human services	30
Business/Office/Marketing	28
Arts/Humanities	19
Mathematics	5
Other	4

High School Teachers:

The total number of high school teachers who answered the survey was 296. The gender balance was equal. Twenty percent (20%) of them had a Bachelor's degree, 79% had a Master's degree, and 1% had a Doctorate degree. The average length of their service as a teacher was 15.7 years while the longest was 39 years and the shortest was 1 year. On average, they had been involved in Tech-Prep for 3 years.

Post-secondary Faculty:

The total number of post-secondary faculty who responded to the survey was 110. Fifty-three percent of the faculty were male and 47% were female. Sixty-two percent of them held Master's degree, 21% had a Doctorate degree and 17% had a Bachelors degree. The courses they taught covered: Math/science (42%), Engineering/technology (28%), Health/Human Service (11%), Arts & Humanities (8%), Mechanical Industrial Trade (5%), and other (6%).

High School Administrators:

Seventy-nine (79) high school administrators responded to the paper-pencil survey. Seventy-two percent were male and 28% were female. Approximately 50% of them were Principals; the remaining categories were: Assistant Principal, Director, Assistant Director, Administrator, Intern, Supervisor, Director, and Superintendent. The average length of experiences as an administrator was 12.2 years. The maximum length was 30 years and the minimum was one

administrator was 12.2 years. The maximum length was 30 years and the minimum was one year. On average, they have been involved in Tech-Prep for 4.2 years.

Post-secondary Administrators:

Forty (40) post-secondary administrators answered the paper and pencil survey. Fifty-six percent (56%) of them were male and 44% were female. Approximately one-third of them held the title of Dean, and the remaining were: Assistant/Associate Dean, Director, President, Vice President, Administrator, and Officer. The average years of experience was 13.3 years with the longest being 36 years and shortest 1 year. They had been involved in Tech-Prep for 3.3 years of average.

High School Guidance Counselors:

Seventy-three (73) high school guidance counselors responded to the paper survey. Of those, 45% were female and 55% were male. Ninety-seven percent (97%) of them had Master's degree and 3% had Bachelor's degree. The average years of their experience was 12 years. They have been involved in Tech-Prep, on average, 3.2 years. The average number of students they advised was 73.

Post-secondary Admission/Career Counselor:

Twenty-six (26) post-secondary admission/career counselors answered the survey. Forty-four percent were male while 57% were female. Eighty-three percent of them held Master's degree, 13% had a bachelor's degree and 3% had a doctoral degree. On average, they had 13 years of experience as a admission/career counselor. They have been involved in Tech-Prep, on average, for 3 years. On average, they advise 190 students a year.

Consortia: «Site»

Consortia Coordinator Survey Tech Prep Consortium Profile

I. Part One – General Consortia Profile

The Consortium:

1. Date your Consortium Established? _____
2. Fiscal Year of First Title III Grant _____
3. Does your Consortium have a Governing Board ? _____yes _____no

Consortium Members:

4. How many of each of the following are part of your Consortium ?

Local Area School Districts	_____	Area Voc-Tech Centers	_____
Community/Technical Colleges	_____	Four-year Post-secondary Institutions	_____
Post Secondary Proprietary Institutions	_____	Employers/Businesses and Associations	_____
Labor Groups	_____	Other Agencies	_____

Consortium Staffing:

5. How many FTEs of the following are devoted to consortium staffing ? Professional _____ Clerical _____

Consortium Funding:

6. The amount of your most recent Title IIIE Grant $_____
7. The date of your most recent Title IIIE Grant _____
8. Other Sources of Funding:
   - Other Perkins $_____
   - State $_____
   - Other: $_____

Part Two – The Program

Model Structure:

9. Please check the following model structure that most closely resembles the one you are implementing in your Consortium:

_____ a. 2 years (11th and 12th grades) of highschool plus 2 years of college (community, junior, or technical)

_____ b 3 or more years of highschool plus 2 years of college

_____ c 2 years (11th and 12th grades) of highschool plus 2 years of college, with options for further study in an articulated program at a 4-year post-secondary institution

_____ d 3 or more years of highschool plus 2 years of college, with options for further study in an articulated program at a 4-year post-secondary institution

_____ e 1 or more years of junior high/middle school plus 4 years of highschool plus 2 years of college

_____ f 1 or more years of junior high/middle school plus 4 years of highschool plus 2 years of college with options for further study in an articulated program at a 4 year post-secondary institution

_____ g Other (Please specify):_____

II. Part Two – The Program (cont)

Career Clusters:

10. Does your Consortium have defined Career Clusters ? _____yes _____no

11. If yes, Check the following Career Clusters that apply to your Consortium:

____a. Agriculture
____b. Business/Office/Marketing
____c. Engineering/Technology
____d. Health/Human Services
____e. Mechanical/Industrial Trade
____f. Arts/Humanities
____g. Other: _____

12. Does your Consortium have a Consortium-Wide Core Program ? _____yes _____no

13. If yes, check the following Core Program elements that apply to your Consortium:

____a. Developing individual secondary/post-secondary course plan
____b. Choosing a broad career cluster
____c. Choosing an occupational specialty
____d. Taking applied academic courses
____e. Taking academic or occupational courses related to career cluster
____f. Career development activities
____g. Workplace experiences

14. Check the following areas of course/program articulation that apply to your Consortium:

____a. Agriculture
____b. Business/Office/Marketing
____c. Engineering/Technology
____d. Health/Human Services
____e. Mechanical/Industrial Trade
____f. Arts/Humanities
____g. Other: _____

III. Part Three – Tech Prep Students

Highschool Students:

15. How many Tech Prep schools have students enrolled in Tech Prep for SY 1996-97 ? _____

16. How many highschool students are enrolled in Tech Prep for SY 1996- 97 in your consortium ? _____

17. Does your consortium have a consortium-wide definition of a Tech Prep Student ? _____yes _____no

18. If yes, check all of the following that apply to your consortium-wide definition of a Tech Prep student ?

____a. Student elects Tech Prep
____b. Student develops a plan
____c. Student takes vocational/technical courses
____d. Student takes applied academic courses
____e. Student participates in workplace experiences
____f. All students not in college preparatory program
____g. All students

III. Part Three – Tech Prep Students (cont)

19. Please list the number of Tech-Prep highschool students and the approximate percent of all students this represents for each grade level:

Grade Level	Number of Tech Prep Students	% of all Students
9th	_____	_____%
10th	_____	_____%
11th	_____	_____%
12th	_____	_____

20. Please indicate the approximate percentage of Tech-Prep students with the following characteristics:

Characteristic	Approximate % of Tech Prep Students
a. White	_____%
b. Black	_____%
c. Hispanic	_____%
d. Native American/Alaskan Native	_____%
e. Asia/Pacific Islander	_____%
f. Unknown	_____%
g. Female	_____%
h. Limited English	_____%
i. Disabilities	_____%
j. Economically/Educationally Disadvantaged	_____%

21. Please indicate Enrollment by Career Cluster:

_____a. Agriculture
_____b. Business/Office/Marketing
_____c. Engineering/Technology
_____d. Health/Human Services
_____e. Mechanical/Industrial Trade
_____f. Arts/Humanities
_____g. Other: _____

22. How many of your consortium's school districts have had highschool Tech Prep students graduate ? _____

a. Total number of students graduated since the program's inception ? _____

b. In the 1996 SY ? _____

Part Three -- Tech Prep Students (cont)

Post-secondary students:

23. Does your consortium have a method for reporting where those students go after graduation ? _____

a. If so, what is it ? _____

24. Please indicate the number of students enrolled in each:

Number of Tech Prep Students	**1993**	**1994**	**1995**	**1996**
Entered Specific Post-secondary programs:				
a. Community/technical college	____	____	____	____
b. Four-year colleges/universities	____	____	____	____
c. Proprietary/post-secondary schools	____	____	____	____
d. Registered apprenticeships	____	____	____	____
e. Armed forces	____	____	____	____
f. Other	____	____	____	____
g. Graduated from articulated post-secondary programs:	____	____	____	____
h. Employed in related jobs after high school:		____	____	____

Part Four -- Support to Student with Disabilities

22. Please circle all of the the following services or accommodations, if any, are being used to facilitate access to Tech Prep for students disabilities or who are disadvantaged:

a. No specific efforts

b. Inclusion of special populations coordinators in the Tech-Prep team or in curriculum/staff development

c. Modified curriculum content and/or instructional method to meet the special needs of a particular group (other than accommodation to students' native languages)

d. Materials and/or instruction in the students' native (non-English) language

e. Interpreters (for non-English speaking or hearing-impaired students)

f. Physical access accommodations

g. Special equipment (e.g. to meet the special needs of a particular group)

h. Transportation

i. Child care

j. Coordination with JTPA youth or similar programs

k. Promotional materials (e.g. brochures or videos) aimed at one or more of these special populations

l. Special career guidance

m. Special tutoring

n. other _____

Part Five -- Articulation Agreements

23. Indicate the number of articulation agreements for post-secondary institutions in your consortia in the following areas:

General articulation agreements _____
(involves the general principle of cooperation and working together, or the general concept of transfer credit)

Specific articulation agreements _____
(involves a focus on specific occupational specialties, programs, or courses, if an institution has both include it in this category)

Please list these post-secondary institutions:

Part Five -- Promotion of Tech Prep

Please check all of the methods that apply to promotion activities that have been used as part of a general consortium-wide marketing effort to promote interest in and acceptance of Tech Prep:

a. Development of Videos on Tech Prep ____
b. Press Releases ____
c. Advertising(print/radio/TV) ____
d. Radio/TV Announcements and Appearances ____
e. Presentations at High Schools and Community Colleges ____
f. Presentations for Employers, Employer Groups, and other audiences ____
g. Logos/logo design contests ____
h. Tech-Prep products (key chains, t-shirts, stickers) ____
i. Career Day/ Trade Shows ____
j. Brochures/Newsletters ____
k. other (please specify) _____ ____

Consortia: **HS student ____**

High School Student Survey of the Tech Prep Program

As a part of an effort to evaluate the New York State's Tech Prep programs we are collecting perceptions about the effectiveness of the program. As a student involved in this program, your input is very important to us. Please read each of the following questions and provide us with your response. To maintain confidentiality of your responses, please place the survey in the accompanying envelope, seal it and return the envelope to _____

About You

Gender: __1.Male __2.Female Age:___ Grade Level:___

Regents Program: ___Yes ___No

Tech Prep Program you are in (if it applies) _____

Tech Prep Courses you have taken or are presently taking: _____

_____

_____

Joining Tech Prep

1. **With whom did you talk when you were making the decision to enter the Tech Prep program? (Please check all that apply).**

__ 1 Parents/Caregivers __2 Teachers __3 Peers
__ 4. Administators __5 Guidance Counselors __6 Others _____

2. **Why did you decide to enter the program?**

3. **How much assistance or information did you receive from your teachers, caregivers/parents and counselors in understanding careers and selecting your career direction? (Please check as many as apply.)**

___ 1. a great deal from at least one teacher
___ 2. a great deal from at least one counselor
___ 3. a great deal from parents/caregivers
___ 4. some from teachers
___ 5. some from counselors
___ 6. some from parents/caregivers
___ 7. little or none from teachers
___ 8. little or none from counselors
___ 9. little or none from parents/caregivers

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About Tech Prep

4. The following statements are about the Tech Prep program and/or classes. Please indicate your level of agreement with each statement by circling the number that best represents your opinion.

1 = strongly agree 2 = agree 3= slightly agree 4= slightly disagree
5= disagree 6=strongly disagree

	Agreement Scale					
	SA					SD
1. The classes cover the materials I need to know.	1	2	3	4	5	6
2. The classes are very job-oriented.	1	2	3	4	5	6
3. The class size is good.	1	2	3	4	5	6
4. The classes have increased my awareness of different jobs.	1	2	3	4	5	6
5. The classes make me work hard.	1	2	3	4	5	6
6. The classes are interesting to me.	1	2	3	4	5	6
7. The classes are preparing me to get a good job.	1	2	3	4	5	6
8. The classes increase my motivation for learning.	1	2	3	4	5	6
9. The classes increase my thinking skills.	1	2	3	4	5	6
10. My self-esteem has increased because of my involvement in these classes.	1	2	3	4	5	6

5. Please check any of the following that you have learned through Tech Prep.

__ 1. Use of specific job skills.
__ 2. How to write a resume.
__ 3. How to prepare for a job interview.
__ 4. Ability to work cooperatively with peers.
__ 5. Ability to manage my time effectively.
__ 6. How to follow directions.
__ 7. How to respond to feedback from boss.
__ 8. How to plan for work to be done.
__ 9. Generating alternate problem solving strategies.
__ 10. Learning to pay attention.
__ 11. Using common sense.
__ 12. Remembering how to do things day to day.
__ 13. Workplace social skills.
__ 14. Dealing with frustration on the job.
__ 15. Punctuality with time schedules.
__ 16. Specific reading skills for the job.
__ 17. Specific math skills for the job.

Your Future Plan

6. What do you plan to be doing 6 months after High School?

7. What do you plan to be doing 5 years after High School?

8. Do you plan to go to college? ____ 1.Yes ____ 2.No

9. If yes: in what area of specialization?

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Consortia: **HS Teacher**

As a part of an effort to evaluate the New York State's Tech Prep programs we are collecting perceptions about the effectiveness of the programs. As a teacher involved in this program, your input is very important to us. Please read each of the following questions and provide us with your response. To maintain confidentiality of your responses, please place the survey in the accompanying envelope, seal it and return the envelope to _____.

About You

Gender: ___ 1. Male ___ 2. Female

Highest degree: Bachelors ___ Masters ___ Doctorate___

Advanced certificate in_____.

What courses do you teach? _____.

How long have you been a high school teacher ? _____.

How long have you been a teacher involved in Tech Prep ? _____.

Support for Tech Prep

1. The following are areas in which you may have received support for the implementation of Tech Prep. For each, please circle the number indicating the level of support you have received.

	Outstanding	Sufficient	Insufficient	No support
1. Materials for the class room.	1	2	3	4
2. Staff development.	1	2	3	4
3. Planning time.	1	2	3	4
4. Support from other teachers/faculty.	1	2	3	4
5. Support from counselors/admissions staff.	1	2	3	4
6. Support from administrators.	1	2	3	4
7. Support from the business community.	1	2	3	4

Staff Development

2. The following is a list of staff development topics that address Tech-Prep related issues, for each, please indicate if you have attended and/or how you feel about attending them. (Please circle your responses.)

	Have attended	Will attend	Would like to attend	No need to attend
1. General information about Tech Prep.	1	2	3	4
2. Recruitment, placement, and retention of students for Tech Prep.	1	2	3	4
3. School relationship with business/industry/labor.	1	2	3	4
4. School to work information.	1	2	3	4
5. Integrating vocational and academic content.	1	2	3	4
6. Application of mathematics, science, and/or communications competencies to the work setting.	1	2	3	4
7. Curriculum development.	1	2	3	4

Your involvement in Tech Prep

3. What has been your involvement in the planning and implementation of Tech Prep during the last three years? (Please check as many as apply.)

__ 1. Served on the planning committee for Tech Prep.
__ 2. Helped develop Tech Prep curriculum.
__ 3. Helped develop the content of the articulation agreements between high school and community colleges.
__ 4. Advised students on Tech Prep recruitment and options.
__ 5. Taught Tech Prep (applied, integrated) course.
__ 6. Participated in Tech Prep meetings with business or community leaders.
__ 7. Attended national or regional conference on Tech Pre
__ 8. Conducted workshops/training on Tech Prep.
__ 9. Presented material at regional Tech Prep conference.
__ 10. Presented material at national Tech Prep conference.
__ 11. Visited Tech Prep programs in other areas.
__ 12. Other_____.

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About Tech Prep

4. The following areas reflect attitudes or perceptions about the Tech Prep program. For each statement, circle your responses to the following statements using this scale:

1= Strongly agree 2=Agree 3=Slightly agree 4=Slightly disagree 5=Disagree 6=Strongly disagree

	Agreement Scale					
	SA					SD
1. Tech Prep is beneficial for former "general program" students.	1	2	3	4	5	6
2. Tech Prep is beneficial for "regents program" students.	1	2	3	4	5	6
3. Integrating academic and vocational skills is crucial to Tech Prep success.	1	2	3	4	5	6
4. Tech Prep is just another short-lived educational innovation.	1	2	3	4	5	6
5. Tech Prep helps to orient students to current workplace requirements.	1	2	3	4	5	6
6. Tech Prep effectively prepares students for post secondary education and/or future employment.	1	2	3	4	5	6
7. I support the continuation of the Tech Prep Program.	1	2	3	4	5	6
8. I believe that the Tech Prep program helps retain students who may have been at risk.	1	2	3	4	5	6
9. Students have positive attitudes about their experience in the Tech Prep program.	1	2	3	4	5	6
10. Student self esteem is raised through the Tech Prep Program.	1	2	3	4	5	6
11. I encourage students to take higher levels of math and science prior to the implementation of Tech Prep.	1	2	3	4	5	6
12. Students seek more career guidance because of Tech Prep.	1	2	3	4	5	6
13. Tech Prep has not changed vocational education.	1	2	3	4	5	6
14. Tech Prep courses are not appropriate for college-bound students.	1	2	3	4	5	6
15. Students in the Tech Program are more focused on career goals than are non-regents program students.	1	2	3	4	5	6

5. How would you assess the transition of students in Tech Prep program from high school to a post secondary institution? (Please choose one.)

__1. Extremely difficult __2. Very difficult __3. Some Problems __4 Little problems __5. No problem at all

If they faced any difficulty, what were they? (Please check as many as apply.)

__ 1. Being away from home
__ 2. Doing assignments
__ 3. Finding their way around campus
__ 4. Getting to know faculty
__ 5. Selecting courses
__ 6. Making friends
__ 7. More responsibilities
__ 8. Using computers
__ 9. Adjusting to a new study routine
__10. Finding a job
__11. Other _____

6. Please provide us with comments, concerns, and issues you may have about Tech Prep:

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Consortia: **HS Administrator** _____

High School Administrator Survey of the Tech Prep Program

As a part of an effort to evaluate the New York State's Tech Prep programs we are collecting perceptions about the effectiveness of the program. As an administrator involved in this program, your input is very important to us. Please read each of the following questions and provide us with your response. To maintain confidentiality of your responses, please place the survey in the accompanying envelope, seal it and return the envelope to _____

About You

Gender: ___ 1. Male ___ 2. Female Title: _____

Years of experience as an administrator _____

How long have you been involved with Tech Prep as an administrator? _____

Support for Tech Prep

1. The following are areas in which you may have received support for implementation of Tech Prep. For each, please circle the letter indicating the level of support you have received.

	Outstanding	Sufficient	Insufficient	No support
1. Supplies, materials and equipment.	1	2	3	4
2. Staff development.	1	2	3	4
3. Planning time.	1	2	3	4
4. Support from other teachers/faculty.	1	2	3	4
5. Support from counselors/admissions staff.	1	2	3	4
6. Support from administrators.	1	2	3	4
7. Support from the business community	1	2	3	4

Staff Development

2. The following is a list of staff development topics that address Tech-Prep related issues, for each, please indicate if you have attended or how you feel about attending them. (Please circle your responses.)

	Have attended	Will attend	Would like to attend	No need to attend
1. General information about Tech Prep	1	2	3	4
2. Recruitment, placement, and retention of students for Tech Prep.	1	2	3	4
3. School relationship with business/industry/labor	1	2	3	4
4. School to work information	1	2	3	4
5. Integrating vocational and academic content	1	2	3	4
6. Promoting cooperation between secondary and post-secondary staff.	1	2	3	4
7. Job placement assistance for students.	1	2	3	4

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Your Invovement in Tech Prep

3. What has been your involvement in the planning and implementation of Tech Prep during the last three years? (Please check as many as apply.)

__ 1. Served on the planning committee for Tech Prep
__ 2. Helped develop Tech Prep curriculum.
__ 3. Helped develop the content of the articulation agreements between high school and community colleges.
__ 4. Advised students on Tech Prep recruitment and options.
__ 5. Visited other Tech Prep programs
__ 6. Participated in Tech Prep meetings with business or community leaders.
__ 7. Attended national or regional conference on Tech Pr
__ 8. Conducted workshops/training on Tech Prep
__ 9. Presented material at national Tech Prep conference
__ 10. Presented material at national Tech Prep conference
__ 11. Other _____

About Tech Prep

4. The following areas reflect attitudes or perceptions about the Tech Prep program. For each, please circle your responses to the following statements using this scale:

1= Strongly agree 2=Agree 3=Slightly agree 4=Slightly disagree 5=Disagree 6=Strongly disagree

	Agreement Scale					
	SA					SD
1. Tech Prep is beneficial for former "general program" students	1	2	3	4	5	6
2. Tech Prep is beneficial for "regents program" students	1	2	3	4	5	6
3. Integrating academic and vocational skills is crucial to Tech Prep success.	1	2	3	4	5	6
4. Tech Prep is just another short-lived educational innovation.	1	2	3	4	5	6
5. Tech Prep helps to orient students to current work place requirements.	1	2	3	4	5	6
6. Tech Prep effectively prepares students for post secondary education and/or future employment.	1	2	3	4	5	6
7. I support the continuation of the Tech Prep Program.	1	2	3	4	5	6
8. I believe that the Tech Prep program helps retain students who may have been at risk.	1	2	3	4	5	6
9. Students have positive attitudes about their experience in the Tech Prep program.	1	2	3	4	5	6
10. Student self esteem is raised through the Tech Prep Program.	1	2	3	4	5	6
11. Articulation agreements are important for Tech Prep success.	1	2	3	4	5	6
12. If federal Tech Prep funds were discontinued, my Tech Prep program would have difficulty in continuing.	1	2	3	4	5	6
13. Administrators are knowledgeable about Tech Prep of funding and curriculum.	1	2	3	4	5	6
14. School board members are knowledgeable about Tech Prep of funding and curriculum.	1	2	3	4	5	6

5. Please provide us with any comments, concerns, and issues you may have about Tech Prep:

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Consortia: _____ HS student ____
Developmental category: _____

High School Student Survey of the Tech Prep Program

As a part of an effort to evaluate the New York State's Tech Prep program we are collecting information about the effectiveness of the program. As a student involved in this program, your input is very important to us. Please read each of the following questions and provide us with your response. To maintain confidentiality of your responses, please place the survey in the accompanying envelope. Seal it and return the envelope to _____.

About You

Gender: ___1.Male ___2.Female Age:___ Regents Track: Yes No

Anticipated Graduation Date: _____

Tech Prep Program you are in (if it applies) _____

Tech Prep Courses you have taken or are presently taking:

Joining Tech Prep

1. To whom did you talk when you were making the decision to enter the Tech Prep program? (Please check all that apply).

__ 1 Parents/Caregivers __2. Teachers __3. Peers
__ 4. Administators __5. Guidance Counselors __ 6. Others _____

2. Why did you decide to enter the program?

3. How much assistance or information did you receive from your teachers, caregivers/parents and counselors in understanding careers and selecting your career direction? (Please check as many as apply.)

___ 1. a great deal from at least one teacher
___ 2. a great deal from at least one counselor
___ 3. a great deal from parents/caregivers
___ 4. some from teachers
___ 5. some from counselors
___ 6. some from parents/caregivers
___ 7. little or none from teachers
___ 8. little or none from counselors
___ 9. little or none from parents/caregivers

About Tech Prep

4. **The following statements are about the Tech Prep program and/or classes. Please indicate your level of agreement with each statement by circling the number that best represents your opinion.**

1 = strongly agree 2 = agree 3= slightly agree 4= slightly disagree
5= disagree 6=strongly disagree

		Agreement Scale					
1.	The classes cover the materials I need to know	1	2	3	4	5	6
2.	The classes are very job-oriented	1	2	3	4	5	6
3.	The class size is good.	1	2	3	4	5	6
4.	The classes have increased my awareness of different jobs.	1	2	3	4	5	6
5.	The classes make me work hard	1	2	3	4	5	6
6.	The classes are interesting to me.	1	2	3	4	5	6
7.	The classes are preparing me to get a good job	1	2	3	4	5	6
8.	The classes increase my motivation for learning	1	2	3	4	5	6
9.	The classes have improved my thinking skills	1	2	3	4	5	6
10.	I have more self esteem because of my classes	1	2	3	4	5	6

5. **Please check any of the following that you have learned through Tech Prep.**

__ 1. Use of specific job skills.
__ 2. How to write a resume
__ 3. How to prepare for a job interview.
__ 4. Ability to work cooperatively with peers
__ 5. Ability to manage my time effectively.
__ 6. How to follow directions
__ 7. How to respond to feedback from boss
__ 8. How to plan for work to be done
__ 9. *Specific math skills for the job.*
__ *10. Generating alternate problem solving strategies.*
__ 11. *Learning to pay attention*
__ 12. *Using common sense*
__ 13. *Rembering how to do things day to day*
__ 14. *Work place social skills.*
__ 15. *Dealing with frustration on the job*
__ 16. *Punctuality with time schedules*
__ 17. *Specific reading skills for the job*
__ 18. *Specific reading skills for the job*

Your Future Plan

6. **What do you plan to be doing 6 months out of High School?**

7. **What do you plan to be doing 5 years out of High School?**

8. **Do you plan to go to college?** ____ 1.Yes ____ 2.No

9. **If you answered yes; what are your career plans 6 months after college?**

10. **What are your career plans 5 years after college?**

Consortia: **HS Counselor ___**

High School Guidance Counselor Survey of the Tech Prep Program

As a part of an effort to evaluate the New York State's Tech Prep programs we are collecting perceptions about the effectiveness of the program. As a guidance counselor involved in this program, your input is very important to us. Please read each of the following questions and provide us with your response. To maintain confidentiality of your responses, please place the survey in the accompanying envelope, seal it and return the envelope to _____.

About You

1. Gender: ___ 1. Male ___ 2. Female
2. Highest degree: Bachelors ___ Masters ___ Doctorate___
   Advanced certificate in _____
3. What grade level or levels do you advise? _____
4. How many years experience do you have as a Guidance Counselor? _____
5. How long have you been involved with Tech Prep as a Guidance Counselor? _____
6. How many students do you advise? _____
7. How do you select students to direct towards the Tech Prep program? _____
   _____

Staff Development

8. The following is a list of staff development activities and topics that address Tech-Prep related topics. Please indicate your desire for information by circling the response that best represents your need and whether you have attended and/or how you feel about attending. (Please circle your responses.)

	Have attended have enough information	Have attended would like information	Would like to attend/get information	No need to attend/get information
1. General information about Tech Prep	1	2	3	4
2. Recruitment, placement, and retention of students for Tech Prep.	1	2	3	4
3. School relationship with business/industry/labor	1	2	3	4
4. School to work information	1	2	3	4
5. Integrating vocational and academic content	1	2	3	4
6. Application of mathematics, science, and/or communications competencies to the work setting	1	2	3	4
7. Career development counseling for students	1	2	3	4
8. Job placement assistance for students	1	2	3	4
9. Information on labor market trends	1	2	3	4
10. Methods of promoting Tech Prep to various consumers.	1	2	3	4
11. Promoting cooperation between secondary and post-secondary staff.	1	2	3	4

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Your Invovement in Tech Prep

9. What has been your involvement in the planning and implementation of Tech Prep during the last three years? (Please check as many as apply.)

__ 1. Served on the planning committee for Tech Prep
__ 2. Helped develop Tech Prep curriculum
__ 3. Helped develop the content of the articulation agreement between high school and community colleges
__ 4. Advised students on Tech Prep recruitment and options
__ 5. Visited Tech Prep programs in other areas
__ 6. Participated in Tech Prep meetings with business or community leaders
__ 7. Attended national or regional conference on Tech Prep
__ 8. Conducted workshops/training on Tech Prep
__ 9. Presented material at regional Tech Prep conference
__ 10. Presented material at national Tech Prep conference
__ 11. Other _____

About Tech Prep

10. The following areas reflect attitudes or perceptions about the Tech Prep program. For each, please circle your responses to the following statements using this scale:

1= Strongly agree 2=Agree 3=Slightly agree 4=Slightly disagree 5=Disagree 6=Strongly disagree

	Agreement Scale					
	SA					SD
1. Tech Prep is beneficial for former "general program" students	1	2	3	4	5	6
2. Tech Prep is beneficial for "regents program" students	1	2	3	4	5	6
3. Integrating academic and vocational skills is crucial to Tech Prep success	1	2	3	4	5	6
4. Tech Prep is just another short-lived educational innovation	1	2	3	4	5	6
5. Tech Prep helps to orient students to current work place requirements	1	2	3	4	5	6
6. Tech Prep effectively prepares students for post secondary education and/or future employment	1	2	3	4	5	6
7. I support the continuation of the Tech Prep Program	1	2	3	4	5	6
8. I believe that the Tech Prep program helps retain students who may have been at risk	1	2	3	4	5	6
9. Students have positive attitudes about their experience in the Tech Prep program	1	2	3	4	5	6
10. Student self esteem is raised through the Tech Prep Program	1	2	3	4	5	6
11. I encourage students to take higher levels of math and science prior to the implementation of Tech Prep	1	2	3	4	5	6
12. Students seek more career guidance because of Tech Prep	1	2	3	4	5	6
13. Tech Prep has not changed vocational education	1	2	3	4	5	6
14. Tech Prep courses are not appropriate for college-bound students	1	2	3	4	5	6
15. Students in the Tech Program are more focused on career goals than are non-regents program students	1	2	3	4	5	6

11. Please provide us with any comments, concerns, and issues you may have about Tech Prep:

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Consortia: _____ PS student _____

Post Secondary Student Survey of the Tech Prep Program

As a part of an effort to evaluate the New York State's Tech Prep programs we are collecting perceptions about the effectiveness of the program. As a student involved in this program, your input is very important to us. Please read each of the following questions and provide us with your response. To maintain confidentiality of your responses, please place the survey in the accompanying envelope, seal it and return the envelope to _____

About You

Gender: __1. Male __2. Female Age: _____

Credit hours accumulated by Dec. 31 1996: _____

Your areas of certification/concentration: _____

Do you have an identified disability (eg. Learning Disability, Attention Deficit Disorder, or Anxiety etc.). _____

Joining Tech Prep

1. **With whom did you talk when you were making the decision to enter the Tech Prep program? (Please check all that apply).**

__1. Parents/Caregivers __2. Teachers __3. Peers
__4. Administators __5. Guidance Counselors __6. Others: _____

2. **Why did you decide to enter the program?**

3. **How much assistance or information did you receive from your teachers, caregivers/parents and counselors in understanding careers and selecting your career direction? (Please check as many as apply.)**

___1. a great deal from at least one teacher
___2. a great deal from at least one counselor
___3. a great deal from parents/caregivers
___4. some from teachers
___5. some from counselors
___6. some from parents/caregivers
___7. little or none from teachers
___8. little or none from counselors
___9. little or none from parents/caregivers

Transition from High School

4. **How would you rate your transition from high school to college/post secondary institution? (Please check one)**

__1.Extremely difficult __2.Very difficult __3. Some Problems __4. Few problems __5. No problem at all

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4a. If you found difficulties, what were they? (Pleases check as many as apply.)

__ 1. Being away from home
__ 2. Doing assignments
__ 3. Finding my way around campus
__ 4. Getting to know faculty
__ 5. Selecting courses
__ 6. Making friends
__ 7. More responsibilities
__ 8. Using computers
__ 9. Adjusting to a new study routine
__ 10. Finding a job
__ 11. Other _____

About Tech Prep

5. The following statements are about the Tech Prep program and/or classes. Please indicate your level of agreement with each statement by circling the number that best represents your opinion.

1 = strongly agree 2 = agree 3= slightly agree 4= slightly disagree 5= disagree 6=strongly disagree

	Agreement Scale					
	SA					SD
1. The classes cover the materials I need to know	1	2	3	4	5	6
2. The classes are very job-oriented	1	2	3	4	5	6
3. The class size is good	1	2	3	4	5	6
4. The classes have increased my awareness of different jobs	1	2	3	4	5	6
5. The classes make me work hard	1	2	3	4	5	6
6. The classes are interesting to me	1	2	3	4	5	6
7. The classes are preparing me to get a good job	1	2	3	4	5	6
8. The classes increase my motivation for learning	1	2	3	4	5	6
9. The classes increase my thinking skills	1	2	3	4	5	6
10. My self-esteem has increased because of my involvement in these classes	1	2	3	4	5	6

6. Please check any of the following that you have learned through Tech Prep.

__ 1. Use of specific job skills
__ 2. How to write a resume
__ 3. How to prepare for a job interview
__ 4. Ability to work cooperatively
__ 5. Ability to manage my time effectively
__ 6. How to follow directions
__ 7. Responding to feedback from my boss
__ 8. How to plan for work to be done
__ 9.Generating alternate problem solving strategies
__ 10. Learning to pay attention
__ 11. Using common sense
__ 12. Remembering how to do things day to day
__ 13. Work place social skills
__ 14. Dealing with frustration on the job
__ 15. Punctuality with time schedules
__ 16. Specific reading skills for the job
__ 17. Specific math skills for the job

Your Future Plan

7. What do you plan to be doing 6 months out of College/Post Secondary?

8. What do you plan to be doing 5 years out of College/Post Secondary?

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Consortia: _____ **PS Faculty**

Post Secondary Faculty Survey of the Tech Prep Program

As a part of an effort to evaluate the New York State's Tech Prep programs we are collecting perceptions about the effectiveness of the program. As a faculty member involved in this program, your input is very important to us. Please read each of the following questions and provide us with your response. To maintain confidentiality of your responses, please place the survey in the accompanying envelope, seal it and return the envelope to _____.

About You

1. Gender: ___ 1. Male ___ 2. Female
2. Highest degree: Bachelors ___ Masters ___ Doctorate ___
   Advanced certificate in _____
3. What courses do you teach? _____

Support for Tech Prep

1. The following are areas in which you may have received support for implementation of Tech Prep. For each, please circle the letter indicating the level of support you have received.

	Outstanding	Sufficient	Insufficient	No support
1. Materials for the class room.	1	2	3	4
2. Staff development.	1	2	3	4
3. Planning time.	1	2	3	4
4. Support from other teachers/faculty.	1	2	3	4
5. Support from counselors/admissions staff.	1	2	3	4
6. Support from administrators.	1	2	3	4
7. Support from the business community.	1	2	3	4

Staff Development

2. The following is a list of staff development topics that address Tech-Prep related issues, for each, please indicate if you have attended and how you feel about attending them. (Please circle your response.)

	Have attended	Will attend	Would like to attend	No need to attend
1. General information about Tech Prep.	1	2	3	4
2. Recruitment, placement, and retention of students for Tech Prep.	1	2	3	4
3. School relationship with business/industry/labor	1	2	3	4
4. School to work information.	1	2	3	4
5. Integrating vocational and academic content.	1	2	3	4
6. Application of mathematics, science, and/or communications competencies to the work setting.	1	2	3	4
7. Curriculum development	1	2	3	4

Your Invovement in Tech Prep

3. What has been your involvement in the planning and implementation of Tech Prep during the last three years? (Please check as many as apply.)

__ 1. Served on the planning committee for Tech Prep.
__ 2. Helped develop Tech Prep curriculum.
__ 3. Helped develop the content of the articulation agreement between high school and community colleges.
__ 4. Advised students on Tech Prep recruitment and options.
__ 5. Taught Tech Prep (applied, integrated) course.
__ 6. Participated in Tech Prep meetings with business or community leaders.
__ 7. Attended national or regional conference on Tech Prep
__ 8. Conducted workshops/training on Tech Prep
__ 9. Presented material at regional Tech Prep conference
__ 10. Presented material at national Tech Prep conference
__ 11. Visited Tech Prep programs in other areas
__ 12. Other _____

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About Tech Prep

4. The following areas reflect attitude or perceptions about the Tech Prep program. For each, please circle your responses to the following statements using this scale:

1= Strongly agree 2=Agree 3=Slightly agree 4=Slightly disagree 5=Disagree 6=Strongly disagree

	Agreement Scale					
	SA					SD
1. Tech Prep is beneficial for students	1	2	3	4	5	6
2. Integrating academic and vocational skills is crucial to Tech Prep success	1	2	3	4	5	6
3. Tech Prep is just another short-lived educational innovation	1	2	3	4	5	6
4. Tech Prep helps to orient students to current work place requirements	1	2	3	4	5	6
5. Tech Prep effectively prepares students for post secondary education and/or future employment	1	2	3	4	5	6
6. I support the continuation of the Tech Prep Program	1	2	3	4	5	6
7. I believe that the Tech Prep program helps retain students who may have been at risk	1	2	3	4	5	6
8. Students have positive attitudes about their experience in the Tech Prep program	1	2	3	4	5	6
9. Student self esteem is raised through the Tech Prep Program	1	2	3	4	5	6
10. Students seek more career guidance because of Tech Prep	1	2	3	4	5	6
11. Tech Prep has not changed vocational education	1	2	3	4	5	6
12. Tech Prep courses are not appropriate for college-bound students	1	2	3	4	5	6

5. How would you assess the transition of students in Tech Prep program from high school to a post secondly institution? (Please choose one)

__1.Extremely difficult __2.Very difficult __3. Some problems __4.Little problems __5. No problem at all

If they faced any difficulty, what were they? (Please check as many as apply.)

__ 1. Being away from home
__ 2. Doing assignments
__ 3. Finding their way around campus
__ 4. Getting to know faculty
__ 5. Selecting courses
__ 6. Making friends
__ 7. More responsibilities
__ 8. Using computers
__ 9. Adjusting to a new study routine
__10. Finding a job
__11. Other _____

6. Please provide us with any comments, concerns, and issues you may have about Tech Prep.

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Consortia: **PS Administrator ____**

Post Secondary Administrator Survey of the Tech Prep Program

As a part of an effort to evaluate the New York State's Tech Prep programs we are collecting perceptions about the effectiveness of the program. As an administrator involved in this program, your input is very important to us. Please read each of the following questions and provide us with your response. To maintain confidentiality of your responses, please place the survey in the accompanying envelope, seal it and return the envelope to _____

About You

Gender: ___ 1. Male ___ 2. Female Title _____

Years of experience as an administrator _____

How long have you been involved with Tech Prep as an administrator? _____

Support for Tech Prep

1. The following are areas in which you may have received support for implementation of Tech Prep. For each, please circle the letter indicating the level of support you have received.

	Outstanding	Sufficient	Insufficient	No support
1. Materials for the classroom	1	2	3	4
2. Staff development	1	2	3	4
3. Planning time	1	2	3	4
4. Support from other teachers/faculty	1	2	3	4
5. Support from counselors/admissions staff	1	2	3	4
6. Support from administrators	1	2	3	4
7. Support from the business community	1	2	3	4

Staff Development

2. The following is a list of staff development topics that address Tech-Prep related issues, for each, please indicate if you have attended and/or how you feel about attending them. (Please circle your responses.)

	Have attended	Will attend	Would like to attend	No need to attend
1. General information about Tech Prep	1	2	3	4
2. Recruitment, placement, and retention of students for Tech Prep	1	2	3	4
3. School relationship with business/industry/labor	1	2	3	4
4. School to work information	1	2	3	4
5. Integrating vocational and academic content	1	2	3	4
6. Promoting cooperation between secondary and post-secondary staff	1	2	3	4
7. Job placement assistance for students	1	2	3	4

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Your Invovement in Tech Prep

3. What has been your involvement in the planning and implementation of Tech Prep during the last three years? (Please check as many as apply.)

__ 1. Served on the planning committee for Tech Prep.
__ 2. Helped develop Tech Prep curriculum.
__ 3. Helped develop the content of the articulation agreements between high school and community colleges.
__ 4. Advised students on Tech Prep recruitment and options.
__5. Visited other Tech Prep programs.
__ 6. Participated in Tech Prep meetings with business or community leaders.
__ 7. Attended a national/regional conference on Tech Prep.
__ 8. Conducted workshops/training on Tech Prep.
__ 9. Presented material at regional Tech Prep conference
__ 10. Presented material at national Tech Prep conference
__ 11. Other _____

About Tech Prep

4. The following areas reflect attitudes or perceptions about the Tech Prep program. For each, please circle your responses to the following statements using this scale:

1= Strongly agree 2=Agree 3=Slightly agree 4=Slightly disagree 5=Disagree 6=Strongly disagree

	Agreement Scale					
	SA					SD
1. Tech Prep is beneficial for students.	1	2	3	4	5	6
2. Integrating academic and vocational skills is crucial to Tech Prep success.	1	2	3	4	5	6
3. Tech Prep is just another short-lived educational innovation.	1	2	3	4	5	6
4. Tech Prep helps to orient students to current work place requirements.	1	2	3	4	5	6
5. Tech Prep effectively prepares students for post secondary education and/or future employment.	1	2	3	4	5	6
6. I support the continuation of the Tech Prep Program.	1	2	3	4	5	6
7. I believe that the Tech Prep program helps retain students who may have been at risk.	1	2	3	4	5	6
8. Students have positive attitudes about their experience in the Tech Prep program.	1	2	3	4	5	6
9. Student self esteem is raised through the Tech Prep Program.	1	2	3	4	5	6
10. Articulation agreements are important for Tech Prep success.	1	2	3	4	5	6
11. If federal Tech Prep funds were discontinued, my Tech Prep program would have difficulty in continuing.	1	2	3	4	5	6
12. Administrators are knowledgeable aboutTech Prep funding and curriculum.	1	2	3	4	5	6
13. School Board members are knowledgeable about Tech Prep funding and curriculum.	1	2	3	4	5	6

5. Please provide us with any comments, concerns, and issues you may have about Tech Prep:

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Consortia: **PS counselor** _____

Post Secondary Admission/Career Counselor Survey of the Tech Prep Program

As a part of an effort to evaluate the New York State's Tech Prep programs we are collecting perceptions about the effectiveness of the program. As an admission/career counselor involved in this program, your input is very important to us. Please read each of the following questions and provide us with your response. To maintain confidentiality of your responses, please place the survey in the accompanying envelope, seal it and return the envelope to _____

About You

1. Gender: ___ 1. Male ___ 2. Female
2. Your job title _____
3. Highest degree: Bachelors ___ Masters ___ Doctorate ___
   Advanced certificate in _____

4. How many years experience do you have as an Admission/ Career Counselor?_____

5. How long have you been involved with Tech Prep as an Admission/Career Counselor? _____

6. How many students do you advise a year? _____

7. How do you know that a student was a part of a Tech Prep program? _____

Staff Development

8. **The following is a list of staff development activities and topics that address Tech-Prep related topics. Please indicate whether you have attended and how you feel about attending.**

	Have attended have enough information	Have attended would like information	Would like to attend/get information	No need to attend/get information
1. General information about Tech Prep	1	2	3	4
2. Recruitment, placement, and retention of students for Tech Prep	1	2	3	4
3. School relationship with business/industry/labor	1	2	3	4
4. School to work information	1	2	3	4
5. Integrating vocational and academic content	1	2	3	4
6. Application of mathematics, science, and/or communications competencies to the work setting	1	2	3	4
7. Career development counseling for students	1	2	3	4
8. Job placement assistance for students	1	2	3	4
9. Information on labor market trends	1	2	3	4
10. Methods of promoting Tech Prep to various consumers	1	2	3	4
11. Promoting cooperation between secondary and post-secondary staff	1	2	3	4

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Your Invovement in Tech Prep

9. What has been your involvement in the planning and implementation of Tech Prep during the last three years? (Please check as many as apply.)

__ 1. Served on the planning committee for Tech Prep
__ 2. Helped develop Tech Prep curriculum.
__ 3. Helped develop the content of the articulation agreement between high school and community colleges.
__ 4. Advised students on Tech Prep recruitment and options.
__ 5. Visited other Tech Prep programs in other areas
__ 6. Participated in Tech Prep meetings with business or community leaders.
__ 7. Attended national or regional conference on Tech Prep
__ 8. Conducted workshops/training on Tech Prep
__ 9. Presented material at regional Tech Prep conference
__ 10. Presented material at national Tech Prep conference
__ 11. Other: _____

About Tech Prep

10. The following areas reflect attitudes or perceptions about the Tech Prep program. For each, please circle your responses to the following statements using this scale:

1= Strongly agree 2=Agree 3=Slightly agree 4=Slightly disagree 5=Disagree 6=Strongly disagree

	Agreement Scale					
	SA					SD
1. Tech Prep is beneficial for former "general program" students	1	2	3	4	5	6
2. Tech Prep is beneficial for "regents program" students	1	2	3	4	5	6
3. Integrating academic and vocational skills is crucial to Tech Prep success.	1	2	3	4	5	6
4. Tech Prep is just another short-lived educational innovation	1	2	3	4	5	6
5. Tech Prep helps to orient students to current work place requirements.	1	2	3	4	5	6
6. Tech Prep effectively prepares students for post secondary education and/or future employment.	1	2	3	4	5	6
7. I support the continuation of the Tech Prep Program	1	2	3	4	5	6
8. I believe that the Tech Prep program helps retain students who may have been at risk.	1	2	3	4	5	6
9. Students have positive attitudes about their experience in the Tech Prep program.	1	2	3	4	5	6
10. Student self esteem is raised because of Tech Prep Program	1	2	3	4	5	6
11. Students seek more career guidance after joining Tech Prep	1	2	3	4	5	6
12. Tech Prep has not changed vocational education	1	2	3	4	5	6
13. Tech Prep courses are not appropriate for college-bound students.	1	2	3	4	5	6
14. Students in the Tech Program are more focused on career goals than are non-regents program students.	1	2	3	4	5	6

11. Please provide us with any comments, concerns, and issues you may have about Tech Prep:

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APPENDIX S-B

INTERVIEW METHODOLOGY & RESPONDENTS

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List of Consortia & Interviews Conducted	96
Interview Protocols	97

TABLE S-B-1
LIST OF CONSORTIA & INTERVIEWS CONDUCTED

	High School						Post-Secondary			
Consortia	SD	Student	Teachr	Adm.	GC	Sp. Needs	Faculty	Adm	Admi	DM
Bronx Community College	1	1	1	–	X	–	1	1	–	–
Broome Community College	2	–	–	1	X	1	–	1	–	1
Cattaraugus-Alleg.any BOCES	1	–	1+1sn	1	1	1	–	–	–	1
Corning Community College	1	1	1	1	1	–	–	–	–	1
Dutchess/Ulster TP Consortium	1	–	1	–	1	1	–	X	–	–
Eastern Suffolk BOCES	1		1	1	–	–	1	1	X	1
Erie I BOCES	1	1	2	1	X	–	–	–	–	1
Fashion Institute of Technology	2	–	–	1	1	–	1	1	–	1
Finger Lakes Comm. College	1	–	–	X	X	1	1	1	–	–
Genesee Community College	1	–	1	–	1	–	–	1	1	1
Monroe Community College	X	–	1sn	–	1	1	–	1	1	–
Mount Vernon City School Dist.	1	–	1	1	1	1	–	–	–	–
Nassau BOCES	1	1	1	1	1	–	–	–	–	1
College of Staten Island	1	1	X	–	–	X	X	–	X	–
NewYorkCity Technical College	1	1	1	–	–	–	1	1	–	–
Niagara County Comm. College	1	–	–	1	1	–	1	1	–	1
Onondaga Community College	1	1	1	1	–	–	–	–	1	1
Orange County Comm. College	1	1	1	–	1	–	–	–	1	1
Onieda-Madison BOCES	1	–	1	1	1	–	–	–	–	–
Putnam/No Westchester BOCES	1	–	–	X	X	–	–	X	X	1
Queensborough Comm. College	1	–	–	–	1	–	1	1	–	1
St. Lawrence-Lewis BOCES	1	1	–	1	–	–	X	1	1	1
SUNY College of Tech Alfred	1	–	1	1	X	1	1+1sn	–	–	–
SUNY ATC at Cobleskill	1	–	–	X	X	1	X	–	–	–
SUNY College of Tech Delhi	1	1	1	–	–	1	–	1	X	1
Syracuse City School District	1	–	3	–	1	–	1	–	1	–
Tompkins-Cortland Comm Coll	1	–	1	1	–	1	–	–	1	1
Two Year College Development	1	–	1	1	1	1	1	1	–	–
Western Suffolk BOCES	1	–	2	–	1	–	1	2	X	–
Yonkers City School District	X	–	1	X	–	–	–	1	1	1

SD = Site Director; Adm = Administrator; Admi = Admission Staff; GC = Counselors; Sp Needs or sn = Special Needs Tchrs;
DM = Decision Makers; Number = Number Interviewed; — Indicates Not Sampled; X Indicates Sampled but Not Possible to do Interviews.

Tech Prep
Site Coordinator Interview Protocol

Interviewee's Name:
Position:
# of Year's with Tech Prep:
Interviewer:
Date of Interview:
Tape # _____

1. How does the Tech Prep program benefit students who are enrolled in Tech Prep classes or the program ?

Probe:

What makes this program unique ? (from Regent's ? from General track ?)
Does it help students make the transfer from higschool to post-secondary ?
If so, how?

2. What teacher/faculty "development" opportunities have occurred in your consortia as a result of Tech Prep ?

Probe:

Who are they for ?
What is the content ?
Which need to be repeated ?
What new development opportunities are needed ?

3. How has the business community reacted to Tech Prep ?

Probe:

Are they involved ? if so, how ?
Are they part of the Tech Prep "steering" or advisory committee ?
Are there any unique or innovative partnerships with colleges or schools and local businesses ? If so, what are they ?
How could this relationship be improved ?

4. Describe the composition of your consortia's steering or advisory committee.

Probe:

For those individuals from highschools or community colleges what "level" (e.g. teacher vs principal) do the primarily represent ?
Are meetings held regularly ?
From your perspective does it appear to be functioning effectively ?
Are there things that you would change ?

5. What is your perception of the quality of the relationship between highschools and post-secondary schools in your consortia ?

Probe:

What elements of that relationship make it a quality relationship ?
How critical are the articulation agreements ?
What might be done to improve them ?

6. What is the relationship between School-to-Work programs in your consortia and Tech Prep ? What are some of these relationships (committees ?)

7. Are there any areas in which you would like to receive assistance/help from the Statewide Coordinators (Jack and Stan) or State Department of Education ? What are they ?

Tech Prep

High School Teacher Interview Protocol

Interviewee's Name:
Position:
# of Year's with Tech Prep:
# of years with school district or as a teacher?
Interviewer:
Date of Interview:
Tape # _____

Question #1:

If you were to describe Tech Prep to another Teacher how would you describe it?

Question #2:

In what way is teaching in Tech Prep different from teaching in traditional classes?

Probes:
Content of the curriculum ?
Methods of teaching ?
Teaching materials?
Applied nature of the program ?
Student - teacher interactions ?
Teacher - community interactions ?

Question 3:

What are some things that work well for you when implementing Tech Prep Curriculum? For instance, What "good things" do you do that you want to make sure to continue in the future?

Question 4:

Are there currently any barriers to implementation of Tech Prep? For instance, are there some things that didn't work? or that made implementation harder?

Question 5:

In what way could Tech Prep be improved? What resources would you need? from whom?

Question 6:

What opportunities has Tech Prep presented for you as a teacher? challenges ?

Question 7:

Finally, I would like to discuss the student outcomes achieved by Tech Prep. Have you observed changes in your students since Tech Prep has been implemented? If so, what kinds of changes?

Probes areas:

---Motivation
---Attendance
---Behavior
---Attitudes
---Career awareness
---Career focus
---other changes

Tech Prep
High School Administrator Interview Protocol

Interviewee's Name:
Position:
District:
Phone:
# of years with district:
Interviewer:
Date of Interview:

Question #1: First, I'd like to ask you some questions about the development and implementation of Tech Prep.

1. Was a mission statement (or something like it) developed for your Tech Prep program ?

   If so, what is it ?

   If not, what is the general "philosophy" of your Tech Prep program ?

2. What resources has your high school committed to Tech Prep ?

   Probe:
   Faculty ?
   Do you have a separate budget for Tech Prep ?
   Are there other sources of funding or support ? (e.g. grants, community organizations, donations, volunteer time)

3. Who was involved in the actual implementation of Tech Prep ?

   Probe:
   Were business organizations involved in the local "steering" committee ? Are they now ?

   Does Tech Prep have a group that acts in an advisory capacity ?
   Were articulation agreements involved in the implementation ?

Question #2: Now I'd like to ask some questions about outcomes which may have resulted from the implementation of Tech Prep.

1. Has Tech Prep "enhanced" your high school's relationship with local business organizations? the community ? colleges ? secondary schools ?

   Probe:
   In what ways ?
   Are there any unique and innovative partnerships with businesses ? If so, what are they ?

2. Has Tech Prep provided staff development opportunties ?

Probe:
Formal opportunities ? If, so what are they ?
Have they been beneficial ? If, so in what ways ?

Question #3: Do you have any additional comments regarding the implementation of Tech Prep?

Tech Prep

High School Guidance Counselor Interview Protocol

Interviewee's Name:
Position:
# of Year's with Tech Prep:
# of years with school district or as a Guidance Counselor?
Interviewer:
Date of Interview:
Tape # _____

Question #1:

If you were to describe Tech Prep for a parent how would you describe it.?
If you were to describe Tech Prep for another guidance counselor how would you describe it.?
---What does Tech Prep mean for students?

Question #2:

How do you decide which students to advise into the Tech Prep program?

Question #3:

What are the benefits or positive outcomes of Tech Prep for the students?
Are there any drawbacks to the Tech Prep program for the students?
--if so what are they.

Question #4:

How do you feel about the Tech Prep program?
--what do you see as the most positive aspects of the Tech Prep program?
--what do you feel needs improvement in the Tech Prep program?

Question #5:

What opportunities have Tech Prep presented for you as a guidance counselor?
Basically describe the staff development process and activities?
---is staff development mandatory?
---is it ongoing?

High School Student Focus Group Questions

Question 1

How did you become involved with Tech Prep courses or the Tech Prep Program?

--what information were you given?
--was it sufficient?
--if not, what else would you have liked to know?

Question 2

Do you think the Tech Prep is covering what you will need to know to be successful in your future job?
--if yes; What has been covered that you feel is job related?
--if not; What do you think would be useful for you to learn?

Question 3

What Tech Prep experiences have been the most useful? How?
--What tech Prep experiences have been least useful?

Question 4

What type of career counseling have you received?
--has the information been sufficient?
--if not; what would you like to know?
--from who have you recieved information?

Question 5

Have you had the opportunity to visit with or work with people who have jobs in your field?

--who did you meet with and/or work with?
--How often did you have these opportunities?
--was it useful? How?

Question 6

What are your future educational plans?
--what are your future work plans?
--where do you want to be 5 years from now?

Tech Prep

Post Secondary Faculty Interview Protocol

Interviewee's Name:
Position:
# of Year's with Tech Prep:
# of years with current institution or as an instructor?
Interviewer:
Date of Interview:
Tape # _____

Question #1:

If you were to describe Tech Prep to another teacher how would you describe it?

Question #2:

In what way is teaching in Tech Prep different from teaching in traditional courses?

Probes:

Content of the Curriculum ?
Methods of Teaching ?
Teaching materials?
Applied nature of the program ?
Student - teacher interactions ?
Teacher - community interactions ?

Question 3:

What are some things that work well for you when implementing Tech Prep Curriculum? For instance, What "good things" do you do that you want to make sure to continue in the future?

Question 4:

Are there currently any barriers to implementation of Tech Prep? For instance, are there some things that didn't work? or that made implementation harder?

Question 5:

In what way could Tech Prep be improved? What resources would you need? from whom?

Question 6:

What opportunities has Tech Prep presented for you as a faculty member ? challenges ?

Tech Prep
Post-Secondary Administrator Interview Protocol

Interviewee's Name:
Position:
District:
Phone:
# of years with district:
Interviewer:
Date of Interview:

Question #1: First, I'd like to ask you some questions about the development and implementation of Tech Prep.

1. Was a mission statement (or something like it) developed for your Tech Prep program ?

   If so, what is it ?

   If not, what is the general "philosophy" of your Tech Prep program ?

2. What resources has your college committed to Tech Prep ?

   Probe:
   Faculty ?
   Do you have a separate budget for Tech Prep ?
   Are there other sources of funding or support ? (e.g. grants, community organizations, donations, volunteer time)

3. Who was involved in the actual implementation of Tech Prep ?

   Probe:
   Were business organizations involved in the local "steering" committee ? Are they now ?

   Does Tech Prep have a group that acts in an advisory capacity ?
   Were articulation agreements involved in the implementation ?

Question #2: Now I'd like to ask some questions about outcomes which may have resulted from the implementation of Tech Prep.

1. Has Tech Prep "enhanced" your college's relationship with local businesses ?the community ? other colleges ? secondary schools ?

   Probe:
   In what ways ?
   Are there any unique and innovative partnerships with businesses ? If so, what are they ?

2. Has Tech Prep provided staff development opportunties ?

Probe:
Formal opportunities ? If, so what are they ?
Have they been beneficial ? If, so in what ways ?

Question #3: Do you have any additional comments regarding the implementation of Tech Prep?

Tech Prep

Post-Secondary Career Counselor Interview Protocol

Interviewee's Name:
Position:
# of Year's with Tech Prep:
# of years with school district or as a Guidance Counselor?
Interviewer:
Date of Interview:
Tape # _____

Question #1:

If you were to describe Tech Prep for a parent how would you describe it.?
If you were to describe Tech Prep for another guidance counselor how would you describe it.?
---What does Tech Prep mean for students?

Question #2:

How do you decide which students to advise into the Tech Prep program?

Question #3:

What are the benefits or positive outcomes of Tech Prep for the students?
Are there any drawbacks to the Tech Prep program for the students?
--if so what are they.

Question #4:

How do you feel about the Tech Prep program?
--what do you see as the most positive aspects of the Tech Prep program?
--what do you feel needs improvement in the Tech Prep program?

Question #5:

What opportunities have Tech Prep presented for you as a guidance counselor?
Basically describe the staff development process and activities?
---is staff development mandatory?
---is it ongoing?

Tech-Prep Decision Maker Phone Interview Protocol

Consortia			
Interviewee's Name		**Phone Number**	
Position			
Interviewer			
Date of Interview	**1st trial:**	**2nd trial:**	**3rd trail:**

1. To what degree have you been involved in Tech Prep? (Degree of involvement)

   Heavily? fairly? So so? Not so much? Not at all?

2. How do you perceive your role in Tech Prep? (Nature/type of involvement)

   Advisory?
   Moral support?
   Facilitation of relation between the business and school?

3. Do you think that Tech Prep has benefited your community?

   If yes, how?

   To students?
   To business-school relations?

4. How do you think that Tech Prep can be improved in your community?

   What are constraints?
   What are the opportunities?

APPENDIX P-A

PAIRS STUDY CODING FORMS & INSTRUCTIONS

Instructions for Coding High School & College Data	**112**
Additional Coding Information -- General	**113**
Conversions From Letter Grades & 4.00 GPA To 100 Basis	**114**
Data Sheets & Forms	**115**

INSTRUCTIONS FOR CODING HIGH SCHOOL & COLLEGE DATA

CONSORID See sheet "Consortium Institutions & ID Numbers" for 2-digit number.

HSSTUDID This HS Student ID Number is the main identification for each case; Enter Flush Right.
CONSTUID This College Student ID Number is for future follow-up. If available, Enter Flush Right.

HSTECHPR This item separates Tech-Prep Students from Control Group Students. No Errors Here!
TPSTATUS Use Only for Tech-Prep Students. If Control Group Student, Skip This Item.

HSSTATUS This is Current High School Status. Every student should be included here.
SPPOPCAT These Special Population categories include various combinations of the first four.
DIPLTYPE If not given on HS Cover Sheet, it may be shown on the HS transcript. If not, omit.

HSYEARS Determine from transcript whether the student took an extra year or more to graduate.
CLASSOF Graduating Class of entering student. If 9th Gr = 92-93, then Senior = 95-96; Use 96.

TPCUM10T See List of Tech-Prep Courses for HS. Do Only for Tech-Prep students. Add 9+10 Grs.
TPCUM10P Same as above, except this is the number of T-P courses which have passing grades.

TPCUM11T Add 11th Grade Tech-Prep courses to the total for 9th & 10th Grades.
TPCUM12T Add 12th Grade T-P courses to 9, 10 & 11th Grades. This totals all T-P courses.

HSAVG9 Don't Use Any Grades Before 9th Grade, Except for RCT or Regents Test Scores.
If Avrg given on Transcript use it rounded to nearest integer (5 to 9 Up 1; 0 to 4 as is).
If not given, Calculate for all academic & technical/occupational subjects only.
Omit all Physical Ed, Health, Music, Art, & other such courses in the Calculation.
If Letter Grades are given, see conversion chart for 100 basis.
CUMAVG12 From transcript; use last cum average integer at or near graduation or Avg Grade Avgs

RCTMATH1 Use Only Raw Score, if given, Not %. Math & Sci are the only RCT's being coded.
RCTMATPF Use 3 or 4 if more than 1 try. Use 1 or 2 if only 1 try.

RCTSCI1 Use Only Raw Score, if given, Not %.
RCTSCIPF Use 3 or 4 if more than 1 try. Use 1 or 2 if only 1 try.

REGMATI1 Should be found in Regents Exam Column on transcript for Math Course I or similar.
REGESC1 Sometimes, Earth Sci is non-Regents usually marked Earth Sci NR; or L=Local; Omit.
The same applies to Math and Biology; NR or L means Not Regents or Local course.

ABSCUM10 Total Number of Absences for 9th Plus 10th Grades, if given.
ABSCUM11 Add 11th Grade Absences to the 9th & 10th Grades Total. If 9 or 10 abs missing; Omit.

COLLEGE COVER SHEETS -- Start with item 2.C., that's COLSTAT (college status).

REMEDIAT Look for Non-Credit Math, Reading, or Writing Courses in Early Semesters.

GPASEM1 If Not Given, Calculate on 4.00 basis. Sum of Grade Value X Credits ÷ Total Credits.
Use Grade Values as A = 4, B = 3, C = 2, D = 1, F =0; W ignore, WP (Penalty) add

ADDITIONAL CODING INFORMATION – GENERAL

1. Any Case from Classes of '98 or '99 (Usually show only 2 years or less of data) = DO NOT CODE. Mark the Green Sheet "Class of "9_, Do Not Code".

2. If 9th or 9th & 10th Grades Data are missing for Transfer In students, DO NOT CODE. Mark Green Cover sheet "Transfer, Do Not Code".

3. Do Not Include any grade of "0" in calculating averages.

4. For High School Drop-Outs or Dismissals, Show only up to 3 Averages. Combine 11th & 12th if necessary. Code all HS Drop-Outs, no matter how early they left.

5. For Students Currently Attending High School – If 4 or more years of grades are shown, Combine 3rd & 4th Year Averages. Omit any grades beyond the 4th year. DO NOT show a 12th Grade average.

6. In general, any entry with 2 spaces available, if value is 100 or more, ENTER 99.

7. For Students Currently Attending High School – For Attendance Absences after 9th & 10th Grades, add ALL THE REST into the 9 + 10 + 11th Grade total. DO NOT SHOW 12th Grade Abs

8. For High School Graduates with More Than 4 years showing, Calculate Averages for 1st four years. DO NOT INCLUDE THE EXTRA YEARS. They will be taken into account in the CUMAVG12 from the Transcript.

9. RCT Scores to be recorded, if given, must be Raw Scores, Not %. Most numbers over 50 in Math or over 60 in Science are %, not raw scores. If uncertain, Omit, but add the PF for the RCT's if available. Sometimes the P or F is given with the score, e.g. 43P.

10. On New York City Board of Education Transcripts:

A. Look at Page 1 – Look for 1st Full Year. DO NOT INCLUDE grades before 1st full year.

B. RCT's are listed on Page 2 in Right Column in Sequence from top to bottom.

C. In same column, look for regents exam scores – SEQMI REG = Sequential Math I; SEQMII REG = Sequential Math II; ESCI REG = Earth Science; BIO REG = Biology. Scores for subjects marked NR (= Non Regents) or L (= Local) are Not Regents Exams.

D. Look for an indication that the Student is in Special Education. This may be written on the cover sheet or on page 1 of the Transcript. Also, most course designations will start with "Y". On separate sheet, write the CONSORID and the Student ID and a note about Special Education so that we may recall the code sheet, if necessary.

E. Look at Item 5.B. on the Green Cover sheet for possible LEP Student. Most course designations will start with an "L". On a separate sheet, write the CONSORID and the Student ID and a note about LEP so that we may recall the code sheet, if necessary.

F. In calculating Grade Averages, Include the Year's Grades in the Occ Educ Column at the Left on Page 2, along with the Academic Grades from Page 1.

CONVERSIONS FROM LETTER GRADES & 4.00 GPA TO 100 BASIS

Letters	4.00 GPA	100	Letters	4.00 GPA	100
	4.00	100		2.20	77
	3.96	99		2.10	76
A+	3.90	98	C	2.00	75
	3.84	97		1.90	74
	3.78	96		1.80	73
A	3.72	95	C−	1.70	72
	3.66	94		1.60	71
	3.60	93		1.50	70
A−	3.54	92		1.40	69
	3.48	91	D+	1.30	68
	3.42	90		1.20	67
	3.36	89		1.10	66
B+	3.30	88	D	1.00	65
	3.20	87		0.90	64
	3.10	86		0.80	63
B	3.00	85	D−	0.70	62
	2.90	84		0.60	61
	2.80	83		0.50	60
B−	2.70	82		0.40	59
	2.60	81		0.30	58
	2.50	80		0.20	57
	2.40	79		0.10	56
C+	2.30	78	F	0.00	55

PAIRS STUDY
HIGH SCHOOL STUDENT DATA SHEET

INSTRUCTIONS:

A. Please attach student's High School transcript.
B. Fill in the General Information in Items 1 through 5.
C. Add your initials & date completed at bottom of the sheet.

General Information:

1. Student's Identification Number: _ _ _ _ _ _ _ _ _ _ _

2. This student's gender is ___MALE ___FEMALE ___DON"T KNOW

3. A. Is/was this student a Tech-Prep participant? ___YES ___NO

   B. If NO, go to Item 3.C.; If YES, Check student's current Tech-Prep status:

   ___Currently in HS Tech-Prep ___Completed HS Tech-Prep ___Discontinued HS Tech-Prep

   C. Check this student's current High School status:

   ___Currently Attending HS ___Graduated HS ___Dropped Out of HS

4. A. Is this student a minority group member? ___YES ___NO ___DON'T KNOW

   B. If YES, check the appropriate category; otherwise go to Item 4.

   ___Black ___Hispanic ___Latino ___American Indian ___Asian ___Other_____
   (Please Specify)

5. A. Is this student part of a special population? ___YES ___NO ___DON'T KNOW

   B. If YES, check the appropriate special population category. Person with

   ___Disability ___Limited English Proficiency ___Economical Disadvantages

   ___Educational Disadvantages

Comments (if any):

Diploma Type (If not on the transcript for graduates)_____
(Show diploma type if applicable)

Dropped-Out of High School {If not indicated on transcript for drop-outs)_____
(Check if Applicable)

COMPLETED BY (Initials Only)_____ DATE COMPLETED:___ ___ ___

PAIRS STUDY
COLLEGE STUDENT DATA SHEET

INSTRUCTIONS:

A. Please attach student's College transcript or, for new Fall 1996 freshmen, the student's current list of courses being taken.

B. Fill in the General Information in Items 1 through 4.

C. Add your initials & date completed at bottom of the sheet.

General Information:

1. Student's Identification Number: _ _ _ _ _ _ _ _ _ _

2. A. Is/was this student a Tech-Prep participant in High School? ___YES ___NO

B. If NO, go to Item 2.C.; If YES, did this student complete the College Tech-Prep program?

___College has no Tech-Prep Program ___YES ___NO, still attending Tech-Prep

___NO, discontinued Tech-Prep

C. What is this student's current College status? (Check One)

___Currently Enrolled ___Graduated ___Has Dropped Out

3. If the title of the curriculum is shown on the transcript or, for new freshmen, the title of the curriculum is shown on the list of courses, omit this item. Otherwise, give the information.

What curriculum was this student admitted to when first attending this College?

_____

(Please Write In The Curriculum Title)

4. For Tech-Prep students, does the student's College curriculum match with the student's High School Tech-Prep program? (Check One)

___YES ___NO ___PARTIAL MATCH ___NOT SURE

Comments (if any):

COMPLETED BY (Initials Only)_____ DATE COMPLETED:____ ____ ____

HIGH SCHOOL CODING FOR DATA ENTRY

CONSORID	Consortium ID Number	|__||__|
HSSTUDID	HS Student ID No.	|__||__||__||__||__||__||__||__||__|
COLSTUID	Coll Stud ID No.	|__||__||__||__||__||__||__||__||__|
GENDER	MALE = 1; FEMALE = 2; DON'T KNOW = 3	|__|
HSTECHPR	Tech-Prep Student? YES = 1; NO = 2	|__|
TPSTATUS	Skip if NO; Currently in TP=1; Completed TP=2; Discontinued TP=3	|__|
HSSTATUS	Currently Attending HS = 1; Graduated HS =2; Dropped Out of HS=3	|__|
MINORITY	Member of Minority Group? YES = 1; NO = 2; DON'T KNOW = 3	|__|
MINORCAT	Black=1; Hispanic=2; Latino=3; Ameren Indian=4; Asian=5; Other=6	|__|
SPECLPOP	Member of Special Population? YES = 1; NO = 2; DON'T KNOW = 3	|__|
SPPOPCAT	Disabled = 1; LEP = 2; Econ Disadv = 3; Educ Disadv = 4; Disabled + LEP = 5; Disabled + Econ Dis = 6; Disabled + Educ Dis=7; LEP + Econ Dis = 8; LEP + Educ Dis = 9; Econ Dis + Educ Dis = 0	|__|
DIPLTYPE	Regents Diploma = 1; Local Diploma = 2; Other = 3; Not Given = 4	|__|
HSYEARS	Four Years or Less to Grad = 1; More Than Four Years to Grad = 2	|__|

HIGH SCHOOL TRANSCRIPTS

CLASSOF	High School Graduating Class – 19__	|__||__|
TPCUM10T	Total Number of Tech-Prep Courses Taken in 9th & 10th Grades	|__|
TPCUM10P	Total Number of Tech-Prep Courses Passed in 9th & 10th Grades	|__|
TPCUM11T	Total Number of Tech-Prep Courses Taken in 9th, 10th & 11th Grades	|__|
TPCUM11P	Total Number of Tech-Prep Courses Passed in 9th, 10th & 11th Grades	|__|
TPCUM12T	Total Number of Tech-Prep Courses Taken in 9, 10, 11 & 12th Grades	|__|
TPCUM12P	Total Number of Tech-Prep Courses Passed in 9, 10, 11 & 12th Grades	|__|
HSAVG9	High School 9th Gr Average (No Art, Music, Phys Ed, Health Ed)	|__||__|
HSAVG10	High School 10th Grade Average (" " " ")	|__||__|
HSAVG11	High School 11th Grade Average (" " " ")	|__||__|
HSAVG12	High School 12th Grade Average (For Graduates) (" " " ")	|__||__|
CUMAVG12	Cumulative High School Average at Graduation from Transcript	|__||__|
RCTMATH1	Regents Competency Test Math Score – 1st Try	|__||__|
RCTMATH2	Regents Competency Test Math Score – 2nd Try	|__||__|
RCTMATPF	RCT Math Pass/Fail; P 1st Try=1; F 1st Try=2; P 2nd Try=3;F 2nd Try=4	|__|
RCTSCI1	Regents Competency Test Science Score – 1st Try	|__||__|
RCTSCI2	Regents Competency Test Science Score – 2nd Try	|__||__|
RCTSCIPF	RCT Science Pass/Fail; P 1st Try=1; F 1st Try=2; P 2nd Try=3; F 2nd Try=4	|__|

HIGH SCHOOL TRANSCRIPTS (Continued)

REGMATI1	Sequential Math I Regents Test Score – 1st Try	|__||__|
REGMATI2	Sequential Math I Regents Test Score – 2nd Try	|__||__|
REGMAII1	Sequential Math II Regents Test Score – 1st Try	|__||__|
REGMAII2	Sequential Math II Regents Test Score – 2nd Try	|__||__|
REGESCI1	Earth Science Regents Test Score – 1st Try	|__||__|
REGESCI2	Earth Science Regents Test Score – 2nd Try	|__||__|
REGBIO1	Biology Regents Test Score – 1st Try	|__||__|
REGBIO2	Biology Regents Test Score – 2nd Try	|__||__|
PSATVERB	PSAT Verbal Score	|__||__|
PSATMATH	PSAT Math Score	|__||__|
SATVERB1	SAT Verbal Score – 1st Try	|__||__||__|
SATMATH1	SAT Math Score – 1st Try	|__||__||__|
SATVERB2	SAT Verbal Score – 2nd Try	|__||__||__|
SATMATH2	SAT Math Score – 2nd Try	|__||__||__|
ABSCUM10	Total Number of Absences in 9th & 10th Grades	|__||__|
ABSCUM11	Total Number of Absences in 9th, 10th & 11th Grades	|__||__|
ABSCUM12	Total Number of Absences 9th thru 12th Grade for Grads	|__||__||__|

COLLEGE COVER SHEETS

COLSTAT	College Status? Currently Enrolled = 1; Graduated = 2; Has Dropped Out = 3	|__|
CURRIC	1st College Curriculum? Business-Related = 1; Engineering-Related = 2; Health-Related = 3; Trade & Industrial-Related = 4; Human Services = 5; Lib Arts & Sci = 6; Criminal Justice & Legal Services = 7; Other = 8	|__|
MATCH	Does Curriculum Match High School Tech-Prep Program? YES = 1; NO = 2; Partial Match = 3; Not Sure = 4	|__|
COMMENT	None = 1; Comment Given = 2	|__|

COLLEGE RECORDS

REMEDIAT	Any Remediation Required? NO = 1; YES, Math = 2; YES, Reading &/or Writing = 3; YES, Both Math Plus Reading &/or Writing = 4; Not Sure = 5	|__|
CURRIC2	Did Student Change Curriculum While in College? YES = 1; NO = 2	|__|
GPASEM1	First Full Semester Grade Point Average (Not Summer School)	|__|•|__||__|
GPASEM2	Second Full Semester Grade Point Average (" " ")	|__|•|__||__|
GPASEM3	Third Full Semester Grade Point Average (" " ")	|__|•|__||__|
GPASEM4	Fourth Full Semester Grade Point Average (" " ")	|__|•|__||__|
CUMAVDEG	Cumulative Grade Point Average at Graduation	|__|•|__||__|
DEGRTYPE	Degree Awarded? AAS= 1; AS= 2; AA= 3; AOS= 4; Bach= 5; Other= 6	|__|

APPENDIX P-B

CONSTRUCTION OF REGRESSION MODELS

	Page
Correlations and Hierarchical Regression Analysis	120
Codes for Predictor Variables Included in the Analyses	120
Correlation Analyses	120
Table P-B-1: Correlation of Predictor Variables with Outcome Variables	122
Hierarchical Regression Analyses	123
Hierarchical Regression Tables P-B-2 to P-B-13	124

CORRELATIONS AND HIERARCHICAL REGRESSION ANALYSIS

The primary goal of this study was to investigate the outcomes associated with Tech-Prep participation. Several student and program variables were measured and used in analyses to control for program effects that may be associated with features unrelated to Tech-Prep. Student level variables included: students' ethnic or racial backgrounds, gender, and grade point averages achieved in grades 9 and 10. Program characteristics included in analyses were: setting in which Tech-Prep program was located and the program's stage of development during the first year in which Tech-Prep was implemented in New York State. Following are the codes for each of the variables used in analyses:

Codes for Predictor Variables Included in the Analyses:

- Race: 1 = White 2 = Ethnic Minority
- Gender: 1 = Female 2 = Male
- 9th Grade HS Average Higher Scores Reflect Higher Averages
- 10th Grade HS Average Higher Scores Reflect Higher Averages
- Rural Settings: 1 = Rural 0 = Suburban
- Urban Setting: 1 = Urban 0 = Non-Urban
- T-P Planned in 1992: 1 = Yes 2 = No
- T-P Implemented 1992: 1 = Yes 2 = Implemented After 1992
- Tech-Prep Status: 1 = In Tech-Prep 2 = Not in Tech-Prep

Correlation Analyses:

The correlation analyses presented in Table P-B-1 indicate that several of the predictor variables were associated with the various performance outcomes assessed in the study. For example, being a member of an ethnic or racial minority group was associated with lower 11th, 12th and cumulative high school averages. Minority group membership was also associated with lower SAT Math, Regents Math I, Biology Regents, and Earth Science Regents scores, as well as higher school absences. Being male was also associated with lower high school averages (including 11th, 12th, and cumulative high school averages), and Biology and Earth Science Regents scores.

Correlation analyses also indicate that students' grades in 9th and 10th grades are closely related to their 11th, 12th, and cumulative high school averages, as well as their scores on the SATs, Math I, Math II, Biology, and Earth Science Regents tests. Students with high 9th and 10th grades also achieved high scores in each of the outcome variables assessed in this study. High 9th and 10th grade averages were also associated with fewer high school absences.

The correlations also suggest that the setting in which schools are located is associated with student outcomes. Students enrolled in rural schools were absent from school fewer days, and achieved high school averages, and SAT, Math I and Biology Regents scores that were higher than those of their peers in suburban schools. Rural students, however, obtained PSAT verbal scores that were lower than those of suburban students. For urban schools, correlations indicate that students enrolled in these schools achieve high school averages, SAT, Math I and Biology Regents scores that were lower than those of their peers in suburban and rural settings. Urban students, however, had PSAT scores that were higher than those of their peers in other parts of the State.

In general, being enrolled in Tech-Prep is associated with higher 11th , 12th, and cumulative high school averages, as well as fewer school absences. Enrollment in Tech-Prep, however, is associated with lower Regents Math II scores. Correlations between time of Tech-Prep implementation and student outcomes suggest that students enrolled in schools with older Tech-Prep programs achieve better outcomes than those students enrolled in schools where Tech-Prep was implemented after 1992.

Despite the usefulness of the correlations reported above, they do not, in themselves provide any indication of the degree to which Tech-Prep participation alone contributes to the various student outcomes measured in this study. For instance, each of the predictor variables included in the analyses are associated not only with the outcome variables, but also with each other. Correlations do not control for the complex manner in which each of the predictor variables may work together to influence student outcomes.

TABLE P-B-1

CORRELATION OF PREDICTOR VARIABLES WITH OUTCOME VARIABLES INCLUDED IN HIERARCHICAL ANALYSIS

Predictor Variables	Outcome Variables											
	11th Gr Avg	12th Gr Avg	Cum 12th Gr Avg	Absences	PSAT Verbal	PSAT Math	SAT Verbal	SAT Math	Math I Regents	Math II Regents	Biology Regents	E. Science Regents
Ethnic/Racial Status	-.28** (1839)	-.26** (1419)	-.30** (1395)	.19** (642)	-.05 (112)	-.11 (112)	-.15 (158)	-.28** (158)	-.20** (1171)	-.23 (943)	-.17** (730)	-.10** (657)
Gender	-.11** (1839)	-.14** (1419)	-.13** (1395)	-.08 (642)	-.06 (112)	.02 (112)	.02 (158)	.05 (158)	.05 (1171)	.02 (943)	-.12** (730)	.17** (657)
9th Grade Average	.55** (1837)	.50** (1417)	.76** (1393)	-.38** (641)	-.00 (112)	.08 (121)	.33** (157)	.44* (157)	.54** (1171)	.52** (943)	.68** (730)	.61** (657)
10th Grade Average	.71** (1839)	.59** (1419)	.83** (1395)	-.51** (641)	.14 (112)	.20* (112)	.45** (157)	.49** (157)	.45** (1170)	.54** (941)	.58** (729)	.54** (656)
Rural Setting	.19** (1839)	.23** (1419)	.24** (1395)	-.20** (642)	-.23* (112)	-.18 (112)	.18* (158)	.28** (158)	.14** (1171)	.02 (943)	.14** (730)	-.03 (657)
Urban Setting	-.20** (1839)	-.25** (1419)	-.26** (1395)	.22** (642)	.41** (112)	.40** (112)	-.18* (158)	-.21** (158)	-.15** (1171)	-.04 (943)	-.16** (730)	.04 (657)
Tech-Prep Planned in 1992	.12** (1839)	.11** (1419)	.18** (1395)	-.07 (642)	# (112)	# (112)	.04 (158)	.06 (158)	.28** (1171)	.29** (943)	.31** (730)	.12** (657)
Tech-Prep Implemented in 1992	-.18** (1839)	-.21** (1419)	-.27** (1395)	.15** (642)	.02 (112)	-.10 (112)	-.07 (158)	.02 (158)	-.32** (1171)	-.33** (943)	-.30** (730)	-.09* (657)
Tech-Prep Status	.13** (1839)	.13** (1418)	.17** (1394)	-.26** (642)	-.09 (112)	-.07 (112)	-.07 (158)	-.13 (158)	.04 (1170)	-.08* (942)	.03 (729)	.02 (656)

Notes: Numbers in parentheses represent the total number of subjects for whom data were available (N)
** Indicates that the correlation is significant at the .01 level
* Indicates that the correlation is significant at the .05 level
# Indicates that the correlation cannot be computed because of insufficient data

Hierarchical Regression Analyses:

To best expose the individual effects of predictor variables, hierarchical regression analyses are employed. The major advantage of the hierarchical analysis is that calculations of the unique contribution of each variable included in the analysis can be made as each variable is entered into the analysis. At each stage of the analysis, the variance associated with the variable entered is partialled out (thus, controlling its correlation with other predictor variables) and information is given about the amount of change in the outcome variable that is accounted for by the predictor variable entered at that point beyond what has been accounted for by the previously entered predictor variables. Thus, in the analyses of the Tech- Prep data, all variables that may contribute to changes in the outcome variables were entered first in the hierarchical analysis. In all analyses students' demographic characteristics (ethnic status and gender) were entered first into the regression. These were followed by students' academic achievement status prior to participation in Tech-Prep, Tech-Prep program setting, and time of Tech-Prep program implementation. After removing effects associated with these predictor variables, students' Tech-Prep status was entered into the model last in order to discover the amount of variation in the outcome variables that could be solely attributed to Tech-Prep participation and not to students' personal characteristics or characteristics of the various Tech-Prep programs. These analyses were run separately for each outcome variable and are presented in Tables P-B-2 through P-B-13. Interpretations of these results are included within the Pairs Study section of this report.

TABLE P-B-2

REGRESSION OF INDEPENDENT VARIABLES ON STUDENTS' 11th GRADE AVERAGE

Variables	Beta	B	F	p	R^2 Change
Step 1: Demographic Characteristics					
Ethnic/Racial Status	-1.81	-.09	21.68	.16	
Gender	-.47	-.02	2.01	.00	.084
Step 2: Academic Achievement Prior To Tech-Prep					
9th Grade Average	.16	.14	39.14	.00	
10th Grade Average	.61	.58	688.07	.00	.441
Step 3: Program Setting					
Rural Setting	-.32	-.01	.13	.72	
Urban Setting	-1.10	-.05	1.73	.19	.002
Step 4: Time Of Program Implementation					
Planned In 1992	-1.45	-.06	5.84	.21	
Implemented In 1992	-.63	-.03	1.56	.02	.001
Step 5: Tech-Prep Status	.82	.04	6.31	.01	.002

TABLE P-B-3

REGRESSION OF INDEPENDENT VARIABLES ON STUDENTS' 12th GRADE AVERAGE

Variables	Beta	B	F	p	R^2 Change
Step 1: Demographic Characteristics					
Ethnic/Racial Status	-1.54	-.09	11.33	.00	
Gender	-1.30	-.07	11.71	.00	.083
Step 2: Academic Achievement Prior To Tech-Prep					
9th Grade Average	.22	.21	51.64	.00	
10th Grade Average	.39	.40	198.29	.00	.309
Step 3: Program Setting					
Rural Setting	-.38	-.02	.10	.75	
Urban Setting	-2.42	-.12	4.11	.04	.010
Step 4: Time Of Program Implementation					
Planned In 1992	-1.54	-.07	4.76	.03	
Implemented In 1992	-1.15	-.06	3.69	.06	.002
Step 5: Tech-Prep Status	.79	.04	4.34	.04	.002

TABLE P-B-4

REGRESSION OF INDEPENDENT VARIABLES ON STUDENTS' CUMULATIVE 12th GRADE AVERAGE

Variables	Beta	B	F	p	R^2 Change
Step 1: Demographic Characteristics					
Ethnic/Racial Status	-1.14	-.04	7.61	.01	
Gender	-.51	-.08	26.69	.00	.096
Step 2: Academic Achievement Prior To Tech-Prep					
9th Grade Average	.32	.38	492.15	.00	
10th Grade Average	.43	.54	1022.89	.00	.686
Step 3: Program Setting					
Rural Setting	.60	.04	1.06	.30	
Urban Setting	-.76	-.05	1.77	.18	.007
Step 4: Time Of Program Implementation					
Planned In 1992	-1.47	-.08	18.78	.00	
Implemented In 1992	-.97	-.06	11.36	.00	.003
Step 5: Tech-Prep Status	.52	.04	8.13	.00	.001

TABLE P-B-5

REGRESSION OF INDEPENDENT VARIABLES ON STUDENTS' ABSENCES DURING GRADES 11 AND 12

Variables	Beta	B	F	p	R^2 Change
Step 1: Demographic Characteristics					
Ethnic/Racial Status	1.02	.02	.11	.74	
Gender	-9.04	-.13	14.70	.00	.044
Step 2: Academic Achievement Prior To Tech-Prep					
9th Grade Average	-.28	-.06	1.91	.17	
10th Grade Average	-1.45	-.42	80.79	.00	.239
Step 3: Program Setting					
Rural Setting	10.03	.14	1.46	.23	
Urban Setting	13.02	.19	2.40	.12	.004
Step 4: Time Of Program Implementation					
Planned In 1992	2.34	.02	.22	.64	
Implemented In 1992	3.00	.04	.78	.38	.001
Step 5: Tech-Prep Status	-8.14	-.12	11.38	.00	.013

TABLE P-B-6

REGRESSION OF INDEPENDENT VARIABLES ON STUDENTS' SCORES ON THE PSAT VERBAL TEST

Variables	Beta	B	F	p	R**2 Change
Step 1: Demographic Characteristics					
Ethnic/Racial Status	1.60	.01	.01	.91	
Gender	-.62	-.01	.01	.91	.007
Step 2: Academic Achievement Prior To Tech-Prep					
9th Grade Average	-.45	-.09	.39	.53	
10th Grade Average	.80	.17	1.41	.24	.040
Step 3: Program Setting					
Rural Setting	7.26	.06	.21	.65	
Urban Setting	70.71	.42	11.00	.00	.141
Step 4: Time Of Program Implementation					
Planned In 1992	*	*	*	*	
Implemented In 1992	-2.43	-.04	.15	.70	.001
Step 5: Tech-Prep Status	-2.57	-.04	.19	.67	.001

* Too few cases

TABLE P-B-7

REGRESSION OF INDEPENDENT VARIABLES ON STUDENTS' SCORES ON THE PSAT MATH TEST

Variables	Beta	B	F	p	R^2 Change
Step 1: Demographic Characteristics					
Ethnic/Racial Status	-1.95	-.02	.04	.84	
Gender	2.81	.06	.46	.50	.012
Step 2: Academic Achievement Prior To Tech-Prep					
9th Grade Average	.04	.01	.01	.92	
10th Grade Average	.05	.15	1.09	.30	.040
Step 3: Program Setting					
Rural Setting	7.56	.09	.46	.50	
Urban Setting	54.06	.45	12.99	.00	.152
Step 4: Time Of Program Implementation					
Planned In 1992	*	*	*	*	
Implemented In 1992	-1.64	-.04	.14	.71	.001
Step 5: Tech-Prep Status	-.91	-.02	.05	.83	.000

* Too few cases

TABLE P-B-8

REGRESSION OF INDEPENDENT VARIABLES ON STUDENTS' SCORES ON THE SAT VERBAL TEST

Variables	Beta	B	F	p	R^2 Change
Step 1: Demographic Characteristics					
Ethnic/Racial Status	-24.32	-.07	.64	.42	
Gender	9.04	.05	.41	.52	.024
Step 2: Academic Achievement Prior To Tech-Prep					
9th Grade Average	1.41	.11	1.40	.24	
10th Grade Average	5.14	.37	15.29	.00	.197
Step 3: Program Setting					
Rural Setting	-2.12	-.01	.00	.96	
Urban Setting	-35.01	-.10	.65	.42	.003
Step 4: Time Of Program Implementation					
Planned In 1992	-35.79	-.16	3.81	.05	
Implemented In 1992	-30.63	-.14	2.91	.09	.025
Step 5: Tech-Prep Status	-4.61	-.03	.11	.74	.001

TABLE P-B-9

REGRESSION OF INDEPENDENT VARIABLES ON STUDENTS' SCORES ON THE SAT MATH TEST

Variables	Beta	B	F	p	R^2 Change
Step 1: Demographic Characteristics					
Ethnic/Racial Status	-45.79	-.13	2.64	.11	
Gender	25.04	.14	3.61	.06	.080
Step 2: Academic Achievement Prior To Tech-Prep					
9th Grade Average	3.56	.28	10.26	.00	
10th Grade Average	3.81	.28	9.65	.00	.243
Step 3: Program Setting					
Rural Setting	32.62	.11	.75	.34	
Urban Setting	12.43	.04	.09	.76	.003
Step 4: Time Of Program Implementation					
Planned In 1992	3.24	.01	.03	.87	
Implemented In 1992	-11.48	-.06	.62	.43	.003
Step 5: Tech-Prep Status	-15.64	-.09	1.50	.22	.007

TABLE P-B-10

REGRESSION OF INDEPENDENT VARIABLES ON STUDENTS' SCORES ON THE REGENTS MATH I EXAM

Variables	Beta	B	F	p	R^2 Change
Step 1: Demographic Characteristics					
Ethnic/Racial Status	-2.43	-.06	5.19	.02	
Gender	4.32	.11	21.39	.00	.045
Step 2: Academic Achievement Prior To Tech-Prep					
9th Grade Average	1.02	.40	157.73	.00	
10th Grade Average	.34	.15	20.84	.00	.288
Step 3: Program Setting					
Rural Setting	1.24	.03	.24	.62	
Urban Setting	-2.13	-.05	.76	.38	.008
Step 4: Time Of Program Implementation					
Planned In 1992	3.40	.07	4.39	.04	
Implemented In 1992	-5.79	-.14	16.52	.00	.037
Step 5: Tech-Prep Status	.31	.00	.11	.74	.000

TABLE P-B-11

REGRESSION OF INDEPENDENT VARIABLES ON STUDENTS' SCORES ON THE REGENTS MATH II EXAM

Variables	Beta	B	F	p	R^2 Change
Step 1: Demographic Characteristics					
Ethnic/Racial Status	-5.55	-.14	22.82	.00	
Gender	3.85	.10	13.97	.00	.055
Step 2: Academic Achievement Prior To Tech-Prep					
9th Grade Average	.53	.20	33.26	.00	
10th Grade Average	1.00	.39	135.35	.00	.316
Step 3: Program Setting					
Rural Setting	-5.92	-.12	3.24	.07	
Urban Setting	-2.48	-.05	.61	.43	.002
Step 4: Time Of Program Implementation					
Planned In 1992	1.94	.04	1.23	.27	
Implemented In 1992	-9.71	-.24	37.19	.00	.068
Step 5: Tech-Prep Status	-2.19	-.05	4.42	.04	.003

TABLE P-B-12

REGRESSION OF INDEPENDENT VARIABLES ON STUDENTS' SCORES ON THE REGENTS BIOLOGY EXAM

Variables	Beta	B	F	p	R^2 Change
Step 1: Demographic Characteristics					
Ethnic/Racial Status	-3.08	-.09	10.11	.00	
Gender	3.90	.13	24.48	.00	.042
Step 2: Academic Achievement Prior To Tech-Prep					
9th Grade Average	.61	.32	58.93	.00	
10th Grade Average	.60	.32	61.76	.00	.390
Step 3: Program Setting					
Rural Setting	.17	.01	.01	.93	
Urban Setting	-4.09	-.13	3.94	.05	.025
Step 4: Time Of Program Implementation					
Planned In 1992	4.55	.13	13.02	.00	
Implemented In 1992	-2.44	-.08	4.58	.03	.036
Step 5: Tech-Prep Status	-.06	-.00	.01	.94	.000

TABLE P-B-13

REGRESSION OF INDEPENDENT VARIABLES ON STUDENTS' SCORES ON THE REGENTS EARTH SCIENCE EXAM

Variables	Beta	B	F	p	R^2 Change
Step 1: Demographic Characteristics					
Ethnic/Racial Status	-1.95	-.07	3.83	.05	
Gender	5.69	.44	48.94	.00	.042
Step 2: Academic Achievement Prior To Tech-Prep					
9th Grade Average	.74	.25	106.74	.00	
10th Grade Average	.43	-.02	35.40	.00	.400
Step 3: Program Setting					
Rural Setting	-.41	-.07	.05	.82	
Urban Setting	-1.91	-.02	1.14	.29	.003
Step 4: Time Of Program Implementation					
Planned In 1992	-.19	-.01	.03	.87	
Implemented In 1992	-.63	-.02	.32	.57	.000
Step 5: Tech-Prep Status	.34	.01	.21	.65	.000

APPENDIX B-A

DESCRIPTIONS OF BEST PRACTICES

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APPENDIX B-A

DESCRIPTIONS OF BEST PRACTICES

FOCUS ON STUDENTS

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Advanced Placement College Credit While In High School
CONSORTIUM: Tech-Prep Consortium of Queens

Background

The opportunity to take college level courses while in high school is a key motivational factor for students to join and stay in the Tech-Prep program. Students take their first six college credits in the business technology and the electrical technology programs.

Discussion

Tech-Prep students take one college-level technology course while in 11th grade and another college-level technology course while in 12th grade. Tech-Prep students have earned over 1,400 college credits while in high school. The materials development program includes preparing books for these college-level courses.

Implementation

All students who join Tech-Prep are automatically eligible to take the college level courses. Courses are offered at each Consortium high school and are taught by high school faculty hired by the college. Courses become part of the regular school program and are offered before the start of or after the end of the regular school day.

Once registered for a college level course, students are also official members of the college community and may visit and use the campus facilities, including the library. This is one reason why students think highly of this program.

Registering students, locating and training faculty, developing appropriate instructional materials, and generally administrating the program is very time-consuming and requires a great deal of preparation and follow-through. Consortiums considering implementing such a program must be willing to make the required commitment in time and effort.

The program is costly (mainly teachers' salaries and instructional materials) when compared to the amount of funds generally available to Consortiums. The financial support of the college (approximately 50%), is crucial to the operation of the program.

For Further Information Contact: Dr. Victor P. Maiorana -- Queensborough Community College
Phone: 718-281-5004; FAX: -5004

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Allied Health
CONSORTIUM: Niagara County Community College

The Allied Health Tech-Prep program in Niagara County provides a unique and wonderful learning opportunity to many high school students interested in health-related careers. The program is taught right in the local hospital environment. Presently, there are four instructional programs located throughout Niagara County in the following school districts: Newfane Central, North Tonawanda, Niagara Falls, and Medina Central.

The program is open to both juniors and seniors, but student selection is based on a careful screening process by school counselors. The hospital setting makes for an attractive "hands-on" backdrop for teaching health careers. Students take the class five days a week and leave the school campus for the course. Morning and afternoon sessions are available, but transportation and time between sites can be a problem especially if two different districts are using the same site, which has been a feature of two programs in the area: North Tonawanda and Medina. There is, of course, only one faculty member teaching at each site as well.

Besides the regular curriculum that has been developed by community college faculty and secondary instructors, the program provides a rich opportunity for experiential learning during normal business hours at the hospital. During the course, students have the ability to shadow a career interest from surgery to pharmacy, nursing to speech pathology with a practicing professional. Once the shadowing experience ends, students have the opportunity to intern with a professional for ten weeks during the course of the year. Scheduling the time to complete the experience with the career mentor can take place after school, weekends, or during class time when instruction is not taking place.

Students also have the ability to visit other medical institutions in Western New York during scheduled field trips to facilities such as Roswell Cancer Center, Strong Memorial Hospital (Rochester), and Buffalo General Hospital. They also have the opportunity to listen to a variety of professionals in their classroom who visit as guest speakers. The variety of classroom experiences and visits, along with a strong shadowing and internship component, make Allied Health one of the fastest growing and exciting programs in Tech-Prep.

For Further Information Contact:

Ms. Sharon Farrugia, Newfane High School
Phone: 716-778-5111, ext. 503

Ms. Deirdre Tomasello, North Tonawanda High School
Phone: (716) 694-4500, ext. 2370

Ms. Lisa Trapasso, Niagara Falls High School
Phone: (716) 287-4145

BEST PRACTICES IN TECH-PREP

TITLE: Applied Academics At LINKS Alternative School
CONSORTIUM: Tech-Prep of South Central New York

Applied Academics has been taught at LINKS (Leadership, Interaction, Need, Knowledge, Skills) at the Madison-Oneida BOCES for the last three years. In general, the program lends itself to introducing students to meaningful practices that can be utilized in a post-school setting or as constructs for advanced schooling. What is especially beneficial is the fact that many of the "applied" units and exercises are "stand alone" and that the students who enter the LINKS setting throughout the year can be integrated into a classroom environment with a minimum of orientation problems.

As might be expected, LINKS gets a variety of students (with varying degrees of academic interest and ability) from several school districts. In addition, the backgrounds of many of these students mitigate the easy transition of introducing a new curriculum and classroom teaching approach. In the area of science, it has been advantageous to selectively pick out topics that are pertinent for the student from the extensive catalog offered in the CORD materials. In the area of applied Math, it has been easier to quantify academic progress. The materials lend themselves more readily for out-of-the-classroom utilization. In both areas (science and math) the students are far more engaged and motivated with the "applied" approach. When this occurs, the role of the teacher becomes that of a facilitator--which is a welcome relief from the day-to-day drudgery of lecture, test, and discipline approach.

For Further Information Contact: Bette Cook or Hal Barry -- Madison-Oneida BOCES
Phone: 315-361-5500; FAX: -5595

BEST PRACTICES IN TECH-PREP

TITLE: Applied Math Program For 8th Graders At Downsville
CONSORTIUM: Tech-Prep of South Central New York

Downsville Central School has committed itself 100% to Applied Math. All 8th grade students (except Accelerated Course I) participate in Applied Math I.

As a Junior High Math teacher, I originally had concerns about preparing our students for Regents Math Course I, the maturity level of the students, and the mixing of high school students with the 8th graders.

The 8th graders especially enjoy using the Scientific Calculators. I find the 8th graders mix very well with the high school students. They show a maturity level that is above previous General Math classes.

For Further Information Contact: Paul Taber – Downsville Central School
Phone: 607-363-2100; FAX: -2105

BEST PRACTICES IN TECH-PREP

TITLE: Bridge Courses
CONSORTIUM: Western Suffolk Tech-Prep Consortium

This practice serves to:

1. **Reduce remediation in college.**
2. **Increase retention rates in the first year of college.**
3. **Improve the number and proportion of students admitted to college.**

While not accumulating credits, these courses allow the students to become familiar with the rigors of college study, note-taking, and the independence associated with college study. Courses are available in the areas of Applied Mathematics, Communication Skills, and Study Skills.

These students are identified through Tech-Prep Testing. Classes are made available to them while the students are in attendance at Wilson Tech. Any of the study areas included give the student the extra skills he or she needs to make the vital difference at the college level.

While completing technical courses at Tech, students accumulate credits toward college. This helps bring career understanding into the academic program. These courses help ease the transition between high school and college which, in itself, is of high value.

For Further Information Contact: Angela Lacara – Western Suffolk BOCES
Phone: 516-667-6000 Ext 375; FAX: -1519

BEST PRACTICES IN TECH-PREP

TITLE: Career Camp
CONSORTIUM: Tech-Prep Of South Central New York

Each summer Career Camp is held at the Delaware-Chenango-Madison-Otsego BOCES. This session consists of one week of career exploration during which students visit businesses and industry, either one-by-one or in group field trips. Portfolios and journals are created by each student, and are shared with fellow students in the fall. The culmination of the week is an overnight visit to SUNY Delhi and a tour of classes and facilities. Students fill out scholarship forms in the Career Service Center to research the scholarships for which they might be eligible.

Parents join the group on the final day for a luncheon. This provides the opportunity to reflect upon and to share each student's experiences for the week.

Career Camp students gain a clearer vision of the future and an idea about how to get from where they are now to where they would like to be. These students have a better direction on where to gain valuable information and to make wiser career choices, including taking courses that open up other options for the future. The prospect of an attractive and attainable career gives young people an incentive to gain academic competence and to behave in a socially responsible manner. This Tech Prep project has been invaluable to the students.

For Further Information Contact: Ginny Amato – Broome Community College
Phone: 607-778-5415

TITLE: Career Connections
CONSORTIUM: Erie County Tech-Prep Consortium

"Striving to Make Career Connections" was the theme for a business/industry career day recently hosted by Iroquois High School. Business and industry presenters brought the world of work to Iroquois High School. Career Connections gave students an opportunity to explore a variety of careers. Forty-five career speakers took time from a demanding work schedule to participate and "trade places" with our teachers.

The morning started with a keynote speaker, Dwight Bonk, Jr. from the Erie County Private Industry Council. The morning was then divided into three sessions where each student would spend 45 minutes with a career speaker. Each student was given the opportunity to choose six business sessions from 45 choices. Every effort was made to give them their first three choices.

A variety of business people shared their knowledge of the work place with students and staff. Customer representatives from Fisher-Price stressed the importance of foreign language skills in all areas of business and demonstrated French, Spanish, German, and Greek-speaking toys and packaging. Links, Inc. of South Wales demonstrated the unique concept of graphic design and photography with the use of computers. Rural Metro Ambulance opened the doors of their ambulance to our students to view. WGRZ-TV2's Ed Kilgore allowed students to tour the TV-2 LIVE truck, and they were on the local news at 5 p.m. The most popular careers that students chose were health-related and were represented by several local hospitals.

Career Connections provided business insights into what students and teachers need to know about business careers and employment opportunities. Student evaluations showed that students were not knowledgeable about the skills and competencies needed in career fields represented during presentations. The students agreed that their knowledge of the skills and competencies was increased after the presentations. Students felt they learned from the presentations concerning speaker description of job duties and work in their career fields. They found this information to be very beneficial. Overall they felt the Career Day program was a very worthwhile activity.

The teacher-staff evaluation was also very high. They felt improvement could be made to pre-plan the date so that students could prepare questions per career ahead of time. The business/industry presenters also believed it was a very valuable day and they also felt that students should prepare questions ahead of time.

In addition to student, staff and business/industry evaluations, students had an opportunity to participate in a Performance-Based Assessment. Those guidelines were made available in homeroom to those students that were interested. The best entry for each grade level will be awarded a $100 savings bond.

For Further Information Contact: Betty Dehr -- Iroquois High School
Phone: 716-652-3000; FAX: -9305

BEST PRACTICES IN TECH-PREP

TITLE: Career Exploration Internship Program At Gilboa
CONSORTIUM: Tech-Prep of South Central New York

The Gilboa-Conesville School is situated in the southeastern tip of Schoharie County, approximately 60 miles from Albany. Students from the school come from nine different towns located in three different counties (Schoharie, Delaware, and Greene).

Despite its natural beauty and geographic size, the school district is noticeably lacking in businesses and manufacturing firms. There are few doctors, lawyers, dentists, engineers, etc. The Gilboa-Conesville Central School exists in a community that is in many ways economically and culturally deprived.

With the help of funding from Tech-Prep, the school was able to implement a Career Exploration Internship Program (CEIP). Students are transported to neighboring communities to intern in career fields of their choice. CEIP is designed to assist students with understanding the linkages between school and work. The program has three major objectives: (1) to provide students with a non-paid work experience to obtain an awareness of a variety of occupations, (2) to provide students with first-hand understanding and appreciation of the knowledge, skill, and education requirements for various occupations, and (3) to introduce students to positive adult role-models who will share their work experiences and stress the importance of "work ethic."

At present, the students enrolled in CEIP have interned in the following areas: chiropractor, anesthesiology, accounting, secretarial, data entry, retail, paralegal, dentist, graphic layout, medical records, physical therapy, chef, and teacher's aide.

For Further Information Contact: Lisa Collins or Dottie Carroll – Gilboa-Conesville CS
Phone: 607-588-7541; FAX: -6820

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: College Placement Assessment
CONSORTIUM: Cattaraugus-Allegany Tech-Prep Consortium

Southwestern New York Tech-Prep Consortium partners Cattaraugus-Allegany BOCES and Jamestown Community College have collaborated to give Tech-Prep students an opportunity to take the College's placement test in their Junior or Senior year of high school, while they still have time to address remediation needs. This testing is part of an overall effort to ease the transition from high school to college and to minimize the amount of remediation required at the postsecondary level.

Students are given the opportunity (on a voluntary basis) to take the JCC Placement Test in eleventh and/or twelfth grade. The test consists of an essay along with mathematics and reading portions of the ACT-ASSET test. The test is administered, scored, and evaluated by staff from the College, and it is given on-site at the three Vo-Tech Centers in the Cattaraugus-Allegany BOCES region.

Prior to testing, students are required to attend a college transition seminar, at which counselors discuss the placement test procedures, as well as numerous aspects of making the change from high school to college. After testing, students are able to speak privately with a JCC counselor, who explains the results of their test and identifies what reading, writing, and math courses would be required should the student attend JCC or a similar college.

For students with remediation needs, help is offered through a joint effort between the BOCES and the college. This is in addition to applied academics already available via the Tech-Prep project. For students who show a readiness for college-level classes, courses are offered by JCC and other colleges over the BOCES distance-learning network, offering advanced placement and college credit for qualified students. All students are also encouraged to attend a one-credit Student Success Seminar, offered via distance learning at the end of the school year.

While this practice is in its first year of operation, it is expected that participating BOCES students will require less college remediation in future years as a result of these efforts.

For Further Information Contact: Larry Sorokes -- Cattaraugus-Allegany BOCES
Phone: 716-372-8293 Ext 288
or Patricia Ash -- Cattaraugus County Campus
Phone: 716-372-1661

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BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: College Proficiency Testing Project for TECH-PREP Students
CONSORTIUM: Mid-Suffolk Tech-Prep Consortium

To better prepare Tech-Prep High School students for college level work, a pilot project was developed between the Mid-Suffolk Tech-Prep Consortium and Suffolk County Community College. Five Consortium school districts participated in the project that provided Tech-Prep students the opportunity to take the College Proficiency Examinations one year prior to high school graduation. This test is used by the college to determine whether incoming freshmen will be required to take non-credit-bearing remediation courses in English and/or mathematics.

Judy Goldberg, Director of Testing at Suffolk Community College, visited each participating high school to conduct the three-hour examinations. The process included an overview of the reasons the college requires these exams, and provided the students with an orientation to the college's expectations for student performance. The test results were returned to the schools within three weeks and a process was developed where college staff were made available to work with their high school counterparts to bring up the skill levels of students with identified deficiencies. The eventual goal is that no Tech-Prep student will require remediation at the postsecondary level.

An additional activity included a group of potential Tech-Prep special education students who were planning to continue on to college. The exam results have been invaluable to their classroom teachers in providing a measurable standard, in math, reading, and writing, to achieve through their individual education plans. One of our consortium's goals is to develop creative strategies to increase the participation of students from special populations in Tech-Prep programs.

Students who successfully complete the CPT will not have to retake the examination.

For Further Information Contact: Judy Goldberg -- Director of Testing, Suffolk Community College
Phone: 516-451-4059

BEST PRACTICES IN TECH-PREP

TITLE: Equine Racing Management Program
CONSORTIUM: Tech-Prep of South Central New York

In cooperation with the New York State 4-H, SUNY Morrisville Equine Racing Management Program offers two one-week programs during the month of July. Participants must be enrolled in a 4-H Program to attend this program. Enrollment is capped at twenty-five participants in each session.

The one-week residential program offers "hands-on" activities for participants, which involves working at the College Equine Center with harness horses. Activities include grooming, harnessing, jogging horses, bathing, cooling out, and wrapping legs.

Lectures are offered each afternoon. Topics include nutrition, reproduction, health and general stable management. A field trip to "A Night at the Races" is included in the program.

For Further Information Contact: William Maddison -- SUNY Coll of Tech -- Morrisville
Phone: 315-684-6297; FAX: -6125

BEST PRACTICES IN TECH-PREP

TITLE: Field Experience For Delaware Academy Students
CONSORTIUM: Tech-Prep Of South Central New York

Students enrolled in the Applied Biology & Chemistry course at Delaware Academy had the opportunity to visit the Veterinary Surgery Labs at SUNY Delhi. Over a three week period, they sat in on several surgeries and had the chance to speak to students and faculty members about the Vet Tech Program at the college. Dr. Foster and his students were especially helpful. The field trip received rave reviews from students and parents alike.

Since the majority of the surgeries the students observed were dog and cat neutering and spaying, the field trip coordinated nicely with the reproductive Subunit of the Applied Biology & Chemistry Course.

When the students studied DNA and Genetics, they visited the New York State Crime Investigation Lab in Port Chester. There they observed work being done in the area of DNA Fingerprinting and related procedures.

The students benefited greatly from these field experiences. They got a chance to see real people using Biology and Chemistry in real jobs. Through the implementation of the Applied Biology & Chemistry course at Delaware Academy, students have the opportunity to gain new insight and appreciation of why learning "this stuff" is so important.

For Further Information Contact: Gary Rothenbucher – Delaware Academy Central School
Phone: 607-746-2103; FAX: -6028

TITLE OF PRACTICE: Improving Motivation of At-Risk and Other Students Toward School
CONSORTIUM: Bronx Tech-Prep Consortium

By improving the attitudes of students toward school through the use of activities that connect their school-based learning experiences to their everyday lives, the value of school, study, and good attendance becomes meaningful to students, and they become more motivated to attend school. And since attendance is the best psychological measure of motivation currently available to educators, we focus our attention on this activity. Our research results indicate significant improvements in attendance and grade point averages among students participating in the Tech Prep Program that in turn results in lower drop-out rates among students at risk. Specific practices that improve student motivation are:

1. Bringing of students to the Bronx Community College campus for Tech Prep orientation meetings focusing on career awareness, career options, college requirements, financial aid, and student services. The more frequently the students visit the college campus the more they identify with the objectives and goals of the program.

2. Career days at the Bronx Community College campus, in which students meet with and interact with non-traditional professional role models from various occupational areas within the field of nursing, human services, and allied health at morning presentations. In the afternoon, students are divided into small groups where they interact with Bronx Community College students who are pursuing careers in nursing, human services and allied health. Thus, students have the opportunity to meet and identify with two different sets of positive role models, while gaining exposure and understanding of various career areas.

3. Study skills workshops are provided at the college and at the individual schools. These workshops are linked to classroom activities and tutoring programs (conducted by trained college tutors in math/science) on site at participating schools. High school guidance counselors oversee these programs, with the assistance of Bronx Community College human service students doing their field-work at the school. Human service interns provide the Tech Prep students with another group of positive role models, with which to share experiences.

4. A series of award programs at the college are designed to recognize student performance and achievement which creates positive motivation. Students, principals, teachers, guidance counselors, Tech-Prep administrators and parents participate in these programs that include a special senior banquet, with entertainment provided by the students.

5. In-school recognition is provided to Tech Prep students through the sponsorship of special breakfast programs, picnics, holiday parties, cultural trips, and other special events which students help to plan.

For Further Information Contact: Dr. Reid Strieby -- Bronx Community College
Phone: 718-289-5227; FAX: -6031

BEST PRACTICES IN TECH-PREP

TITLE: Increasing Retention In High School And Moving On To College
CONSORTIUM: Greater Broome Tech-Prep Consortium

Doing class problems of real life application, and then doing the lab activities motivates students to stay in school. Students see a real life application via video, which gives them visual support for learning a lesson. They can also do problems in lab activities, which provides them with direct experience. When they actually see the application through video or try the application in lab, students can better understand what they are learning.

Seeing the connection between what they are learning in school and its application in the work world is motivating for the students. This learning is supported by the opportunity students have to visit work places on field trips.

Because Tech-Prep encourages students towards high standards, students are also encouraged to attend post-secondary institutions and to think about careers and career goals. Tech-Prep in cooperation with Broome Community College and participating schools planned an all-day visit to the college. Students were able to become familiar with the facilities, meet with heads of departments where they were given an overview of the programs and information about careers, meet with students, and receive information and encouragement about attending college.

For Further Information Contact: Phil Cali -- Susquehanna Valley Central School District
Phone: 518-775-9146; FAX: -4575

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Interdisciplinary Portfolio Assessment for 12th Grade Fashion Technology Curriculum

CONSORTIUM: Fashion Institute of Technology Tech-Prep Consortium

FIT's Tech-Prep 12th grade fashion technology course entitled, "Exploring the Business of Fashion" is the quintessential applied interdisciplinary one-year course. Curriculum developers in fashion, math and language arts joined forces to create a course based on problem-solving activities. The result is a product which students then analyze, evaluate, and reflect on, in order to assess the efficacy of strategies employed in the process. The course consists of 11 units, including: lifestyle merchandising, competitive environment, fashion influences, responses to customer needs, textile product development, manufacturing, merchandise planning process, resource selection, buying activities, store layout and promotional effort.

The interdisciplinary portfolio requires the individual student to keep a personal record of curriculum-related activities. These activities are connected to three subject areas, namely: fashion business, mathematics and language arts. The portfolio revolves around those units concerned with the development of a t-shirt product, specifically units 1 - lifestyle merchandising, unit 5 - t-shirt development, and parts of unit 6 - t-shirt manufacturing. Although students complete all assignments as members of a small team, they are required to individually complete and keep all assignments in a three-ring binder - the personal portfolio. For example, each student must create a survey to target the potential market; they must write copy informing customers about the t-shirt; they compare and contrast the quality of imported versus locally made t-shirts; they consider views on international trade agreements, and demonstrate a thorough knowledge of fiber content. Students must also advertise the t-shirts, learn about recycling textiles, arrange for the manufacture of the t-shirt, draw up the business and manufacturing plans, including space allocation, and calculate costing and accounting practices.

The portfolio assessment creates scoring rubrics for each lesson presented by the instructors. Students must produce essays, items, charts, checklists, advertising copy, garment lists, letters to vendors or trade commissions, worksheets, textile experiments, mathematical calculations, accounting ledgers, manufacturing plans, space allocation plans, to be put into the binder and submitted to instructor for scoring after the lesson is complete. Each lesson rubric is scored by either the technology, language arts or math instructors, or a combination of all three. At the completion of the course the student is left with a complete portfolio record of all activities; and a summary grade can be calculated from the quantified rubric scores. At semester's end, each group produces its best version portfolio based on materials produced individually, and then discussed in the group.

For Further Information Contact: Dr. Frank Guida -- Consultant to FIT
Phone: 201-946-0621; e-mail: fit-tp@worldnet.att.net

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Job Shadowing
CONSORTIUM: Tompkins-Cortland Community College Tech-Prep Consortium

Teachers in the Tech-Prep program arrange job shadowing opportunities for their students. They have put together a workbook to help the student get the most out of the experience. Students are helped to prepare for the job shadow by doing research on the company, and by making a list of questions related to the employee's background and work experience. Students write letters confirming the job shadow and follow up with thank-you notes after the experience.

For Further Information Contact: Peggy McKernan --Tompkins-Cortland Community College
Phone: 607-844-8211; Fax -6535

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Job Shadowing and Collaborative School/Business Partnership
CONSORTIUM: Central New York Tech-Prep Consortium

The Job Shadowing Program at the Cicero-North Syracuse High School is a Tech-Prep model program.. While there are many job shadowing programs in existence, this one is unique because it is part of a comprehensive K-12 School-to Work initiative of personal and career development known as Collaborative School/Business Partnerships. The curriculum is carefully designed to guarantee thorough career exploration by providing student learning opportunities that are contextual and "hands-on" at every level. While the job shadowing experiences for students in kindergarten through eighth grade help students to identify personal aptitudes, talents and interests and to match them with the careers they investigate, the job shadowing which follows at the high school level is more focused and intensive. The groundwork has been laid: students have a clear sense of themselves and have methodically narrowed their career goals into career clusters. The high school job shadow is intended to provide in-depth real-life opportunities to learn what specific skills and post-secondary training or education is needed in the careers which they have chosen. Students requesting subsequent job shadows in the same career fields are placed progressively to reach the student's specialization so that the career exploration process is thorough and complete.

Students apply for a job shadow experience through the high school career center/guidance department specifying three occupations of interest. Within one week, students are issued a job shadow packet which contains forms to be completed by students and parents. Students are required to research the occupations as much as possible prior to the actual shadow experience. When the job shadow packet is completed, a staff person will assign an appropriate mentor and the job shadow will be arranged. Thereafter, each student will be provided with an instructional packet with specific directions to the site, acceptable attire and a job shadow questionnaire which the student will use as a guide to suggested questions for the mentor. Within five days of a job shadow, students will complete an evaluation form and a short narrative describing how the job shadow impacted the student's career exploration efforts as well as thank-you notes to mentors. Finally, mentors are requested to complete evaluation forms in an effort to constantly find ways to improve or enhance job shadowing experiences in which they are involved.

The Job Shadowing Program at Cicero-North Syracuse High School which has been in existence for several years is a positive motivator of students with measurable outcomes. It is the collaboration of students, parents, teachers, business/industry, and administration that make it successful. There is a strong commitment on the part of the school district administration which has ensured the superiority of the program by providing the resources necessary for success: a full-time professional staff and a well-equipped career center. A resourceful program coordinator has recruited a diverse group of members of the business community which has enriched this program to include a full complement of occupations for students to explore. In addition, the coordinator has been especially effective at disseminating information about the program to the public, having received numerous awards and media coverage.

For Further Information Contact: Marcia Drumm -- Onondaga Community College
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BEST PRACTICES IN TECH-PREP

TITLE: Keeping At-Risk Students In School Through Experience-Based Education
CONSORTIUM: Greater Broome Tech-Prep Consortium

Applied Mathematics is taught in the Experience-Based Education program at Binghamton High School. In this program, the students are better able than in traditional mathematics classes to see the relevance of math in everyday life, and they enjoy the variety of activities encountered in the curriculum.

An example of real-world applied math is an experiment involving the effect of insulation. A sheet of styrofoam, one square foot in area, is attached to the inside of the classroom window. Three thermometers are placed as follows: one outside the window, one inside the classroom at the insulation, and one inside the classroom at an uninsulated portion of the window. Measurements are taken when sun is not a factor from early Winter and conclude in Spring. The data are analyzed and reported by the class as an exercise in energy conservation.

All of this helps keep the students in school. The majority of students enjoy the Applied Math activities so much that they take math beyond New York State's two-year requirement.

For Further Information Contact: Mary Ann Cottone or Dee Smith--Binghamton HS
Phone: 607-762-8200; FAX: -8138

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: L.A.B.O.R. - Learning About Better Opportunities Responsibly
CONSORTIUM: Finger Lakes Tech-Prep Consortium

Objectives: To expose students to the world of work through hands-on experiences.
To provide students an opportunity for career exploration.
To provide students an opportunity to meet a professional in their career field of interest.

All Sophomores at Romulus Central School, Seneca County, New York participate in the LABOR project. Participants apply for a job in an area closely related to their career interest. Each student completes a job application, resume, cover letter, a one-page report about the occupation, requests two letters of recommendation, and finally participates in a 30-minute "live" interview with an individual who is an expert in his or her field. This two-week project is broken down into two phases.

Phase I: The application, cover letter, resume, letters of recommendation and occupation research.
Phase II: Preparation for interview, a business presentation, practice "mock" interviews, and the final interview.

Day 1: All materials are provided to students and assignments covered with deadlines assigned.
Day 2: Classes meet in Media Center. Research paper is reviewed against stated criteria. Research materials are available, and counselor, teachers, and media specialist are available for assistance.
Day 3: Students prepare resume and cover letter on computer during a double period in computer labs.
Day 4: Classes meet in computer labs to edit and produce final draft of resume and cover letter.
Day 5: All final copies are due and portfolios are sent to interviewers.
Day 6: Students perform an overview of interviewing skills, brainstorm ideas and thoughts about the interview process.
Day 7: A representative from Bryant and Stratton speaks to students and provide handouts on the do's and don'ts of interviews.
Day 8: Students participate in "mock" interviews (role play) in class. Interviews are tape recorded, students are interviewers, interviewees, and observers. The observers critique interviews.
Day 9: Each student completes a 30-minute interview. Interviewers complete evaluation on each student. At the conclusion of the interviews, interviewers will announce their selection for job opening. Each winner receives a bonus grade of 100.

Grading:

Application for Employment	10%
Resume	10%
Cover Letter	10%
Two Letters of Recommendation	10% each
One-Page Report on Occupation	20%
One 30-Minute Interview	30%
	100%

One-page report must include the following information: major responsibilities of job, skills needed, education and training, job potential, salary range, and why student would like this occupation. Grammar, punctuation, spelling, and sentence structure are critical components as well.

For Further Information Contact: David Hubman -- Romulus Central School District
Phone: 315-585-6751; FAX: 607-869-5961

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Mohonasen High School Career Majors
CONSORTIUM: Two-Year College Development Center

Within the last two years, four Career Majors have been implemented at Mohonasen High School. Those Career Majors are:

1. Computer Aided Design and Drawing
2. Material Processing
3. Child Care / Human Services
4. Business Management / Business Administration

Two or more Career Majors under development during the 1996-97 school year are:

Pre-engineering
Medical Technology

The unique aspect of Career Majors at Mohonasen is that they expanded five unit sequences up to 7 or 8 credits in a Career Major area. In addition, a CEIP internship experience of 108 hours is encouraged. Each Career Major has led to an articulation agreement with local community colleges, enabling students to earn anywhere from 3-15 college credit hours.

Career Major Profile
CADD Tech-Prep

5 Unit Sequence

	Unit
Introduction to Occupations I	1/2
Technical Drawing I	1/2
Architectural Drawing I	1/2
CADD 1	1/2
CADD 2	1/2
Computer Application	1/2
Technical Drawing II or Architectural Drawing II	1
Technical Drawing	1

ADDITIONAL CAREER MAJOR ENHANCEMENTS

Introduction to Career Majors	1/2
CAM (Computer-Aided Manufacturing)	1/2
Systems Course (one of the following) Production, Transportation or Communications	1/2
Technology Electives	1/2-1/2
CEIP Internship (108 hours of nonpaid career internship)	1
Cooperative Work Experience (300 hours of paid career experience)	1

For Further Information Contact: David W. Troy -- Mohonasen High School
Phone: 518-356-5010; Fax: -1418

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Nontraditional Role Model Career Days
CONSORTIUM: Greater Capital District Tech-Prep Consortium

The gender equity component of the Greater Capital District Tech-Prep Consortium uses individuals, working in technical occupations nontraditional to their gender, as role models to foster interest in such occupations among middle and high school students who are potential Tech-Prep enrollees. Role model visits to schools are organized, and related instructional activities for teachers to use before and after the role model visits have been developed.

An initial role model project was held for middle school students of the Fonda-Fultonville School District in May, 1993. Each year since, additional school districts have replicated or adapted this project to meet the needs of their middle school or high school students.

This approach allows for student exposure to a variety of role models working in fields nontraditional to their gender. Sessions are divided equally between role model presentations and interaction between students and role models. The use of hands-on demonstrations by role models is important and add immensely to the session. Scheduling of students into sessions tends to be a time-consuming element of this project, although some schools have had recent success using computer programs to complete this task.

Identifying and contacting appropriate nontraditional role models is critical for a successful program. Best results often occurred when schools used former graduates or community members. Many have found this to be such a rewarding experience that they volunteer to return year after year. A training session for role models to welcome the role models and prepare them for their presentation is strongly suggested. Since many are not accustomed to being in a classroom, it is important to familiarize them with what to expect, how to engage the interest of the age group they will be addressing, and to give ideas on appropriate and interesting hands-on activities.

A wrap-up session held immediately after the program is helpful in fine-tuning the project for future years. The project planners, role models, teachers and administrators are all invited to share feedback about the experience. An evaluation is given to students, teachers, and role models.

A detailed listing of the steps required to replicate this initiative model is available from this office. Materials to assist with this project, including guidelines and tips for role models, guidelines for teachers, instructional activity packets, sample student scheduling formats, and student and role model feedback forms are also available.

For Further Information Contact: Connie Spohn, Two-Year College Development Center, SUNY Albany
Phone: 518-442-5590; FAX: -9055

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Providing Effective Work-Place Learning Experiences
CONSORTIUM: Bronx Tech-Prep Consortium

The Bronx Community College Tech-Prep program provides students with two types of paid work-place experiences. The first type is part of the Summer Youth Employment program jointly sponsored by the New York City Board of Education and the Department of Employment. Our program includes a school-based and work-based learning experience that is connected through two or three pre-employment workshops at the college and work-site orientation seminars.

The school-based learning experience is centrally located (students from all three of our participating high schools attend the summer school class at a designated high school). A specially designed communication course focuses upon the enhancement of reading and writing skills and includes subject matter drawn from the fields of allied health, human services and nursing. The course is team-taught by a high school English teacher and a college faculty reading expert. Students attend class five mornings per week, have lunch and then go to their work assignment in a hospital or nursing home where they work a total of 24 hours per week over a 4-day period. Students have weekly reading and writing assignments and must prepare a term report on their work-site experience. In addition, they are evaluated by their field work supervisor at the completion of the program.

The second type of work-place learning experience takes place after school. This program is called the "Tech-Prep Learn program." Students in this program work 15 hours per week. Within the program they must maintain a satisfactory grade point average and attendance record at school, interview a health professional at their work-site, keep weekly logs of work activities and attend work-site training sessions. Students in this program make job observations and are assigned specific work-site tasks by their field supervisor. This program lasts the entire school year. These students also must attend a job skills workshop at the college as part of pre-employment training.

For Further Information Contact: Dr. Reid Strieby -- Bronx Community College
Phone: 718-289-5227; FAX: -6031

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Research a Health Care Facility in Your Community
CONSORTIUM: Nassau County Tech-Prep Consortium

The Long Beach City School District has provided high school students with real-life learning experiences, which directly impact their motivation and improve their success in school. Our midterm project required students to research health care facilities in the community, which involved interviews with administrators about various aspects of their facility. Facilities researched by the students included outpatient clinics at a community hospital, non-profit skilled nursing facility/health-related facility, methadone maintenance clinic, family alcohol counseling and treatment services, rehabilitation center, and home care nursing services.

This project provided a review of units of study that the students had just completed, enabled students to apply what they had learned in the classroom to the workplace setting, provided opportunities for dialogue with Health Care Professionals, and familiarized students with health care services available within their community. The units covered in class were: Health Care Delivery Systems, Roles of Health Care Workers, and Safety and Legal Issues in Health Care.

Before the project began, students were assigned in pairs to conduct their research. They prepared handouts describing the assignment and interview topics, and listed the names and locations of health care facilities, contact persons and phone numbers. They were required to contact all health care facility directors to ascertain their willingness to participate in the project, and obtain the name of a contact person for student interviews.

The information students were to obtain at the interview focused on (1) the type of health care facility, location, and name of contact person; (2) the scope of services provided, geographical area and client population served; (3) how the agency was funded, whether there was outside funding, and how the agency was reimbursed for services it provided to clients; (4) how employees were selected and trained; (5) legal and safety issues of greatest concern; (6) what provisions were made for a client who experienced an emergency outside the agency's normal hours of operation; (7) a tour of the facility, if possible; (8) obtain available literature such as descriptive pamphlets, Patient's Bill of Rights, job descriptions, etc.

Class time was provided to allow partners to collaborate on their schedules, the distribution of responsibilities, and other aspects of planning and implementing their duties. They also had opportunities to discuss and role-play professional telephone communication and professional interview techniques, and, finally, to present oral reports.

Upon completion of the assignment, students had had experience in working cooperatively with a classmate to set an appointment, plan and conduct the interview, and to prepare a written report and oral presentation. They had had practice in using appropriate telephone communication techniques and interviewing a Health Care Professional to obtain specific information about a health care facility. They also learned to acquire, organize and report information about a health care facility in writing, communicate information they obtained in an oral presentation, and apply their knowledge of Health Careers, Health Care Delivery System, Roles of Health Care Worker, and Safety and Legal Issues to the workplace setting.

For Further Information Contact: Carol Henck, MA, RN -- Long Beach High School
Phone: 516-897-2070; FAX: -2052

BEST PRACTICES IN TECH-PREP

TITLE: Serving The "At-Risk" Student Successfully
CONSORTIUM: Greater Broome Tech-Prep Consortium

The largest benefit of Tech-Prep in Endicott High School is keeping the "at-risk" student in upper-level, challenging math and science classes. These students would have dropped out of any other type of math class after their second course. Tech-Prep classes are fun and at the same time students are learning valuable information. They are almost always able to make connections between math class and the kinds of jobs in which they are interested. They see value in mathematics because they can apply their math knowledge to real-life situations.

Examples of Applied Math activities include presenting a chart showing Yankees' and Mets' payrolls; having students figure out how much salaries increased and decreased, finding average salaries, and having them explain the large difference between the two. Another activity involves the use of statistics: on a sheet of paper containing a list of items, students are asked to write down (anonymously) their favorite things, events, and activities, wishes and plans for the future, etc. When the sheets are collected, our classes are able to use the answers for our project in statistics.

Examples of some of our lab activities include teaching students graphing averages, using equations, and calculating distance and time. After they have obtained their calculations, they are asked to explain how they got their answers, to choose the better method for the problem they're working on, and to predict what would happen in a slightly different situation. In Applied Math III, students are taught to solve equations with a graphing calculator, work with a partner, and justify their answers. They are also given challenging problems which earn them bonus points.

In applying math problems to real life, students can appreciate the value of math. They have the opportunity to work with a partner, which fosters not only cooperation in solving problems, but they can also discuss the problem with their partner, explain their thinking, and how they got their answers. This results in better understanding of the problem and finding successful solutions.

For Further Information Contact: Amy Mertson -- Union Endicott High School
Phone: 607-757-2181; FAX: -2839
or Stan Reksc and Sue Barnes -- Binghamton High School
Phone: 607-762-8200; FAX: -8138

BEST PRACTICES IN TECH-PREP

TITLE: Shadowing Program In Technical And Applied Communications At VVS
CONSORTIUM: Tech-Prep of South Central New York

Vernon-Verona-Sherrill High School has been involved with Tech Prep of South Central New York for the last four years. Starting with a prototype project of designing an Applied Communication Curriculum Model for seniors, the program has grown each year. Presently over 50% of the senior class at VVS takes the Technical and Applied Communication Course for their English 12 credit.

Students identify their career path of interest early in the course and then create professional documents focusing on this choice. The course is divided into instructional modules on business correspondence, directions and instructions, personnel evaluations, abstracts recommendations, site visitations, oral presentations, and various other applied works. All of the documents are created to professional standards in the Computer Lab, and all students retain the portfolio of their documents (hard copy and on disk) when they graduate.

The centerpiece of last year's program was a one-day shadowing program where students were able to spend a workday with a professional/business person/worker of their choice. The 100+ students involved in this experience write a request letter to their host, conducted pre-visitation interviews, and created a post-visitation follow-up report and letter to the host. Students were involved in shadowing doctors, chefs, carpenters, truck drivers, mechanics and persons of numerous other occupations.

The positive feedback about the 12th grade program has prompted the school to offer an Applied Communications program to selected 9th grade students; and plans for the upcoming years include extending the program through all high school grades.

For Further Information Contact: Jim Pawlika or John Dudus-- Vernon-Verona-Sherrill HS
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BEST PRACTICES IN TECH-PREP

TITLE: Student Orientation to Tech-Prep and College Life
CONSORTIUM: Tech-Prep Consortium of Queens

Background

An orientation program entitled the Summer Institute was held for entering Tech-Prep students in the summers of 1994 and 1995. In this program, students spent three days on campus participating in computer workshops, Whole Teaching/Whole Learning workshops, and college workshops designed to familiarize students with the physical layout of the college and the benefits of attending a community college. Students who attended felt motivated to do well in the program and gained confidence in their ability to continue their education.

Discussion

Tech-Prep students now attend orientation in the Fall of their junior year. Budget cuts have eliminated the Summer Institute. However, incoming students who had heard about the visits to the college were interested in participating in the consortium's abbreviated version of the institute.

Implementation

All entering Tech-Prep students participate in an orientation session given at the college. Each high school provides transportation to the college for interested students. Arriving students are given a lesson in Whole Teaching-Whole Learning in a college lecture hall. Questions about the program are answered and benefits including college credit and use of the campus are explained. Faculty members, site coordinators and Tech-Prep students who are graduating address the incoming students. Students are then given a snack and a tour of all the facilities on campus.

In receiving feedback from students attending orientation, they report feeling more confident about their decision to enter the program. During the question and answer period, it is apparent that many students had no idea how to proceed with their education after high school. Issues such as financial aid applications, transcript requests and registration procedures were thoroughly discussed and students were enlightened to processes of which they were previously unaware. Students also reported a sense of belonging to a special group as a motivational factor in the program. Most of the students leave the orientation with a positive feeling towards their future and excited about using the college's facilities such as the recreational center, library and computer labs while still in high school. Many of the Tech-Prep students have no access to computers at home. Students have communicated to the Tech-Prep Project Office that the computer skills they obtain in school are enhanced by the availability of computers for their use at the college.

For Further Information Contact: Dr. Victor P. Maiorana – Queensborough Community College
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BEST PRACTICES IN TECH-PREP

TITLE: Summer Internship
CONSORTIUM: Niagara County Tech-Prep Consortium

In 1993, two years after the initial planning grant, the consortium organized a summer internship program modeled after the Career Exploratory Internship Program (CEIP), which is recognized by both the New York State Departments of Labor and Education. Like many other consortia, the guidelines provide the student with a school-based and work-based opportunity to explore a specific career interest. The internship process consists of 116 hours of course work with a 108-hour work experience along with a variety of policies and procedures to which both the student and employer must adhere.

The project in Niagara is different than those of other state consortia in that our Tech-Prep office leads in the training, placement, and evaluation of all placed high school students in the internship experience. Many other programs, both state and nationwide, rely on the high school to handle their own internship affairs, which has both positive and negative aspects. When each high school is allowed to handle the placement process, business partnerships can become territorial and exclusive and not shared with other consortium schools. This process also requires a high school faculty and/or staff member to develop their own model which may not be consistent with overall consortium goals and objectives. While the adopt-a-school approach works very well in many school models across the country, Niagara's School-to-Work and Tech-Prep projects act as the clearinghouse of all experiential learning opportunities county-wide. Through this process, all school districts, businesses, and students share in the variety of opportunities available to them with clear expectations and outcomes. The process also allows the College to act as the single connection in developing partnerships which cuts down on the multi-school interaction which tends to turn business interest away from involvement.

Niagara's program starts with in-school presentations to juniors in high school about the opportunities and benefits of internship involvement. Since the junior year is the initial year of specific technical training, developing close relationships with each articulated school is important. After each presentation, students are given applications for the program. During the spring semester, students interested in a placement are required to attend an all-day Internship Training Seminar. This six-hour session has four workshops in the following subject areas: Resume Writing, Interview Techniques, Workplace Ethics & Safety, and a Student Forum. Each workshop session is conducted by an employer from our placement database or a professional from the field. Students are given the opportunity to work on their resumes, ask important questions, and hear about past interns' experiences.

After the seminar, each student is then interviewed by the Tech-Prep director for interest, travel abilities, and interests. Then students are allowed to be placed. Since 1993, over 250 students have been eligible to participate and over 125 have completed the internship program. Niagara's Consortium has 80 business partners from a variety of retail, office, engineering, and manufacturing organizations.

For Further Information Contact: John D. Craig – Niagara County Community College
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BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Teaching And Learning Based On Cognitive-Analytic Strategy
CONSORTIUM: Tech-Prep Consortium of Queens

Background

Education at all levels is based on two self-defeating strategies. They are called Behaviorism and Sequentialism. Behavioral learning objectives describe what a student should know and be able to do once a topic has been covered. However, they do not promote understanding of the subject matter to be learned. Sequentialism is the static and serial arrangement of subject matter topics -- as in textbooks -- without making dynamic intellectual connections within and among topics. This causes students to see learning as an act of memory and not analysis.

Behavioral - Sequential strategy and practice encourages the underprepared and ESL student to drop out while the prepared student receives crystallized intelligence only. No student is directly and systematically provided with a dynamic cognitive framework for developing SCANs-based thinking, reading, writing, and problem-solving abilities. "According to national assessments, only about 10% of U.S. 17-year-olds can draw conclusions using detailed scientific knowledge; just 7% can solve math problems with more than one step; only 7% can read and understand specialized materials; and a mere 2% can write well-developed material" (*What Matters Most: Teaching for America's Future*, p. 5).

Discussion

On the other hand, Cognitive-Analytic strategy and practice provides: (1) the underprepared student with another chance at school success because it draws on little-used intellectual abilities shared by all humans, (2) the ESL student the opportunity to use their innate intelligence, and (3) directly helps all students to develop essential and critical thinking, reading, writing, and problem-solving abilities.

Cognitive-Analytic strategy is based upon Whole Grammar (not connected to whole language). Whole grammar recognizes that the grammar of spoken and written language is a natural evolution of humankind that provides cognitive structure and supports analysis. Accordingly, the world's subject matter, the object of language as viewed through grammar, must necessarily contain and reflect that same cognitive structure. By providing a whole constructive view of human thought through purposeful - meaningful/consequential analysis, whole grammar reveals the whole, dynamic meaning within all content. Such whole meaning promotes understanding and application of subject matter by making knowing a matter of active construction of content within the context of developing essential and critical abilities in teachers and students. The strategy has been recognized in *The Journal of Reading*, had its effectiveness reported on in a study by CUNY-CASE, and was the subject of a grant from the CUNY Faculty Development Program.

Whole Grammar strategy is operationalized for use in across-the-curriculum classrooms through the use of over eighty cognitive frameworks and a series of over one-hundred special, teacher-developed whole thinking, reading, writing, listening, speaking, and problem-solving techniques. Existing teaching techniques —such as constructivist, theme, multiple intelligences, cooperative, problem-based, interdisciplinary, and applied academics learning; writing in the content areas; critical thinking programs and others -- are given new meaning when employed within the Whole Grammar framework. Taken together, these cognitive frameworks and techniques are referred to as Whole Teaching - Whole Learning.

Implementation

Implementation of Cognitive-Analytic strategy for grades 5 through 14 is accomplished through a professional development program and through the development and use of instructional materials that employ the strategy. For a discussion of the professional development program, see Tech-Prep Consortium of Queens' Best Practices write-up "Staff Development Program In Whole Teaching - Whole Learning."

For Further Information Contact: Dr. Victor P. Maiorana -- Queensborough Community College
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BEST PRACTICES IN TECH-PREP

TITLE: Teamwork In Principles Of Technology
CONSORTIUM: Greater Broome Tech-Prep Consortium

In our Principles of Technology course students work in small groups to study physical systems. For example, in our lesson on belts and pulleys, students learn to assemble a working system on a breadboard. They conduct experimental measurements with photo tachometers and other instruments. They apply algebraic equations to determine ideal and actual mechanical advantage and speed ratios. This is followed with written observations and related problem-solving.

Learning experiences such as this provides experience in teamwork, which is necessary for working in the real world. Students enjoy working in teams supporting each other, and their attendance has improved as a result.

For Further Information Contact: Chuck Goodwin – Union Endicott High School
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BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Tech-Prep Physics: An Inclusive Model
CONSORTIUM: New York City Technical College Tech-Prep Consortium

The NYCTC Tech-Prep program works with students at differing levels of academic achievement in its engineering technology component. As a result, we have developed a three-tiered approach to physics which we believe suits the needs of the wide variety of students we serve. The first two are implemented with George Washington Vocational and Technical High School, a traditional Vo-Tech school; the third is being used at Brooklyn Technical High School, an elite academic high school with an engineering focus.

Initially, the project developed a strategy to respond to students whose academic performance would not normally result in their placement in Regents physics. In this approach, students work exclusively in a hands-on laboratory setting at NYCTC twice a week for two hour blocks utilizing the "Tools for Scientific Thinking" curriculum developed at the Center for Science and Mathematics Teaching at Tufts University. The curriculum features microcomputer-based laboratory materials for student development of concepts and intuition in the laboratory. The curriculum is Tech-Prep friendly since this lab setting offers students the use of probes and sensors to collect data that is graphed in real time and then manipulated and analyzed. This approach offers concrete learning in context and in-depth understanding of concepts in a cooperative learning, student-centered environment. The program has been successful. Over the four years in which we have used it, we have experienced over 85% student success.

Although the program was originally intended for non-Regents students because the curricular approach exposes students to fewer topics than are required within the traditional Regents, we have been able to adapt it for use in Regents physics as well. The Regents students, many of whom are in Tech-Prep, have been able to substitute it for the Regents laboratory program. At this point the class does over half their lab work in this way. Again, the results are favorable. The class success rate on the Regents remains high (the pass rate is over 90%) and students have the benefit of the conceptual approach, the group learning strategies and the interaction with technology that are key in the curriculum.

At Brooklyn Tech, the project has more recently been developing a Regents project specific to its program in mechanical engineering. In this design, physics and mechanical engineering are both taught within an inquiry-based construct. Students work in groups on projects that are assessed through a presentation process. In the first year of development, the physics teacher worked within the Tech-Prep teaching team to adapt the traditional physics curriculum for a inquiry-based methodology. Regents results paralleled the school-wide success rate: over 85% pass. This year, the physics and the mechanical engineering teacher are working to integrate the two curricula. Within this framework, physics and mechanical engineering concepts are being chronologically aligned, covered in both classes through an inquiry methodology and assessed through a common activity. In addition, classes are scheduled back-to-back to allow for expanded time as needed.

Through these initiatives, we believe we have established a Tech-Prep physics component that is valuable for a variety of reasons. It is appropriate for the range of students that Tech-Prep typically serves - from high achievers to mid-range students who usually do not enroll in physics - and would have a similar application in a non-Tech-Prep setting. It incorporates learning strategies and methodologies consistent with Tech-Prep and the standards. It also is demonstrating success within the current Regents format and, because of the contextual and inquiry nature of the curriculum, as well as the use of its methodologies and use of instructional technology, holds promise for success under a revised Regents structure.

For Further Information Contact: Anne Gawkins -- New York City Technical College
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TITLE: Tech-Prep Testing
CONSORTIUM: Western Suffolk Tech-Prep Consortium

This practice serves to:

1. **Provide effective applications of career majors and educational path planning.**
2. **Improve the number and proportion of students admitted to college.**

Every tech student is administered an extensive placement test. Students who score in the highest percentiles are given the opportunity to attend a local college and study at least three (3) credits at no cost. Potential participants for bridge courses are also identified through this process.

The value of the college credits is surpassed only by the student's advanced placement and his or her ability to demonstrate mastery of college level studies. These activities do much to enhance student self-esteem and motivation to continue his or her education beyond high school.

For Further Information Contact: Angela Lacara – Western Suffolk BOCES
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BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: 12th Grade Language Arts Unit
CONSORTIUM: Fashion Institute of Technology Tech-Prep Consortium

An open-ended unit entitled "Auto/Biographical Investigations" is designed to help students articulate the facts of their own lives and gain a perspective about their places in the larger society. Rather than covering all parts of the unit at once, teachers interweave elements of it throughout the year to prompt a sustained and meaningful investigation of the topic. Students have begun this exploration in the 11th year and continue it in their college composition course.

In an early part of the unit, students read and analyze one full-length auto/biographical work, such as In My Place by Charlene Hunter-Gault. The work by Gault, one of two young people who integrated the University of Georgia in 1961, provides our students with two opportunities: to understand that goals can be achieved and obstacles overcome, and to deepen their understanding of the facts of segregation, discrimination, and the Civil Rights Movement. This has the added benefit of helping students to prepare more thoroughly for the state examination in US History and Government.

Other aspects of the unit help students extend their biographical investigations while familiarizing them with the purpose, content, and format of a college-level cross-curricular text. For example, one such reader, Inquiry, by Bloom and White, presents students with key rhetorical concepts associated with college-level writing courses as well as a cross-section of autobiographical essays.

Finally, this autobiographical practice encourages students to investigate, record, and communicate information about the lives of people in the workplace. This assignment involves on-site interviews, secondary research, peer discussion and presentations.

For Further Information Contact: Professor Joan Stern – Fashion Institute of Technology
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BEST PRACTICES IN TECH-PREP

TITLE: Use Of Technology
CONSORTIUM: Greater Broome Tech-Prep Consortium

Whenever possible, we use graphing calculators and computers in Applied Math classes to enhance interest and facilitate results. We have the time to do this because our curriculum is more flexible than the Regents program, which is the standard college preparatory curriculum in New York State. Some examples are:

1) In Applied Math IV we use the Geometer's Sketch Pad to do transformations. We can see quickly the results of reflecting across parallel lines is really a translation and across intersecting lines is a rotation. Slopes can be determined immediately to discuss the direction of a translation. Lengths of sides can be determined quickly and used to show the ratios are constant in a dilation, so the figures are similar. The students created some beautiful designs.

2) In Applied Math III we used Future Graph and TI-81 calculators to learn about $y=a \sin bx$ and $y=a \cos bx$. The meaning of amplitude and frequency are quickly developed without tedious hand calculations. We also learned how to find the roots of an equation from the graph of the function on the TI's.

3) In Applied Math II, we learned about graphing lines and comparing their slopes on the graphing calculators.

Any time an average student achieves success through using technology, he has a good chance of getting turned on to mathematics.

For Further Information Contact: Dee Smith – Binghamton High School
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TITLE: Workplace Learning -- Internship
CONSORTIUM: Greater Capital District Tech-Prep Consortium

The accelerated Tech-Prep programs at the Capital Region Vo-Tec are a result of a partnership between Vo-Tec and local community colleges enabling students to earn college credits and a transcript while still in high school.

An unpaid internship component is a requirement of the Tech-Prep Auto, Early Childhood and Culinary Arts programs at the Capital Region Vo-Tec. Local businesses offer students an opportunity to put classroom skills to use in an actual work situation.

Before beginning the internship second semester, students complete a video-based workplace skills assessment program covering: interaction with others; listening skills; structuring work activities; trainability; and interpretation of graphs and charts. Other requirements include resume preparation and interviewing techniques; rotation through more than one department or area; keeping a journal of activities which becomes part of the student's portfolio; a progress report and final evaluation completed by the worksite mentor or supervisor. Students also complete a self-evaluation based upon their work experience.

Each of the three programs have additional requirements for the internship components required by a particular instructor. For example, the students in the Culinary Arts program are required to provide documentation of hours worked toward the required hours for internships at Schenectady Community College. Students in the Automotive program planning to pursue the GM program at Hudson Valley Community College have required placements at GM dealerships.

Since Tech-Prep is a collaborative effort (the internship component offers proof of this), we recognize our partners with an Appreciation Brunch at the completion of the internship component. Parents, home school guidance counselors, college and Vo-Tec faculty, interns and mentors are honored for their active support and participation. This is an excellent opportunity to recognize the important role that all partners play in successful Tech-Prep programs.

For Further Information Contact: Ruth Truesdell -- Albany-Schoharie-Schenectady BOCES
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APPENDIX B-A

DESCRIPTIONS OF BEST PRACTICES

IMMEDIATE INTEREST TO FACULTY

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Curriculum Development
CONSORTIUM: Oneida-Herkimer-Madison BOCES - Modern Maufacturing Institute

Although it was originally proposed that a group of four teachers develop Tech-Prep curricula, the MMI advisory committee permitted an alternate approach. The Tech-Prep Coordinator recruited one math, science, English, or technology teacher from each of the participating school districts and the community college. Teachers responded from 11 school districts, the BOCES Alternative Education program, and Mohawk Valley Community College. These 18 teachers have had only three substitutions and one addition from the original team configuration of three years ago. Teachers met weekly in the first year; bi-weekly in the second year, and monthly now.

Teachers collaborated across disciplines to determine program outcomes. They worked in discipline groups to write the curricula, which was then evaluated by the whole team. After the draft curricula was written, these "team" teachers asked other teachers in their districts to pilot activities. Feedback from these pilots was then incorporated into final versions. Again, all teachers did final evaluations of all curricula.

Presently these teachers are serving as Tech-Prep "coordinators" in their home schools, serving as conduits for information between applied classrooms and faculty meetings and the Tech-Prep Project Coordinator.

The benefits of this approach are:

- Teachers from different districts got to meet each other.
- Not only did they meet, they got a chance to work together. People who would never have had an opportunity to collaborate (e.g., English and technology teachers from different districts) not only worked together, they have collaborated now for up to three years.
- Teachers learned much about practices in other districts.
- Secondary teachers learned much about community college, and vice versa.
- Teachers increased their knowledge of other disciplines.
- Teachers learned about their similarities and differences. Many now believe in the validity of multiple intelligences and learning styles because of their experiences in working with others who view the world very differently.
- The acceptance of other teachers has been good; possibly because of the following reasons: numerous teachers collaborated to put the curricula together, someone from their district was one of the teachers, and the curricula was put together by an interdisciplinary team.

For Further Information Contact: Marilyn Kelly -- Oneida-Herkimer-Madison BOCES
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TITLE: DACUM Competency Profile
CONSORTIUM: Genesee Region Tech-Prep Consortium

The Business, Applied Communications, Applied Math, and Applied Science Committees of the Genesee Region Tech-Prep Consortium each developed Competency Profiles through the DACUM (Developing A CUrriculuM) process. The skills and competencies identified by each committee were validated by businesses as essential for students to have for entry into the workforce. This validation encouraged and promoted the development of partnerships with business and industry.

In each skill area, the committee identified a number of competencies which students must demonstrate before mastery is reached. The competencies students need to develop are often referred to as exit outcomes. These are first identified (what is it we want students to know?). Then a path leading to those outcomes (how do I get there?) is developed. This pathway resulted in specifying the necessary competencies to acquire those skills. The profile is written in easy-to-understand rubrics. The methodology allows students choice of the degree of mastery by completing work to the desired achievement level.

The Competency Profile is used throughout the consortium by teachers in each area. Teachers develop lessons around this profile, and students are aware of the criteria necessary to complete each skill at mastery level. A student having applied and demonstrated the various competencies has mastered the specific skill.

Teachers in the Math, Science, Communications, and Business areas have developed innovative instructional strategies and methods to parallel the desired skills as they strive to acquire the goals of the DACUM Competency Profile. For example, the high school math teachers have written variances for Math I, II, and III. Math I and Math II variances have been approved by the state. A student successfully completing both Math I and Math II is eligible for one Regents credit (the Regents program is the standard college preparatory curriculum in New York State). The Math III variance is currently in the revision stage.

A committee wrote curricula and developed a "test bank" for Math I and Math II variances. The entire "test bank" of questions was approved, and this allowed the teachers to modify or change the test each year by choosing pre-approved questions from the "bank."

Student learning is significantly impacted in each area by the student's awareness of how the skills transfer to real life tasks. Many students have commented on how "it now makes sense how I'll use this." Using the applied methodology has motivated student learning by providing a hands-on approach to learning. This has typically promoted a work-like environment of collaborative peer efforts to complete assignments and projects. While developing a variety of the SCANS skills necessary for employability, students acquire competencies to identify and appropriately use resources, develop interpersonal skills, problem-solve, organize, master, and apply these transferable skills.

For Further Information Contact: Betty Powers – Genesee Community College
Phone: 716-344-5721; FAX: 716-345-1907

BEST PRACTICES IN TECH-PREP

TITLE: Developing A Comprehensive Career And Advisement Counseling Program
CONSORTIUM: Bronx Tech-Prep Consortium

A comprehensive career and advisement counseling program has been developed over time by bringing together high school guidance counselors and college guidance faculty in bi-weekly small group training sessions. Prior to these meetings a Tech-Prep guidance counselor was selected by the principal at each high school to oversee the Tech-Prep students. Likewise, a college faculty member in the college Student Development Department was designated to work with the Tech-Prep staff on developmental issues.

Bi-weekly meetings were then scheduled at the college for student guidance counselors from all three high schools in the consortium, the college guidance counselor and the Tech-Prep staff. These meetings provided the opportunity for all parties to understand the goals and objectives of the Tech-Prep program, define roles and responsibilities, exchange views on problems within the program, and develop the specific systems, methods and procedures needed to create a comprehensive career and advisement counseling program. In addition, by meeting on a continuous basis we created open channels of communication between guidance counselors at individual schools. This procedure provided the means to develop parallel counseling activities across schools that contributed to the integration of Tech-Prep objectives and goals.

For Further Information Contact: Dr. Reid Strieby – Bronx Community College
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BEST PRACTICES IN TECH-PREP

TITLE: Developing Innovative Marketing And/Or Recruitment Plans
CONSORTIUM: Orange County Tech-Prep Consortium

In the three years the Pre-engineering Program has been in place at Orange-Ulster BOCES, the enrollment has grown from seventeen students to its current enrollment of sixty-three. This 370% growth in enrollment has occurred at the same time the school has seen a 10% increase in enrollment. Pre-engineering's growth has occurred at a steady rate each year, progressing from seventeen to twenty-six to thirty-eight to sixty-three.

There are several actions I have taken to foster this growth. The first is networking. Our BOCES supports eighteen member school districts. I have, through the use of guidance counselor meetings, teacher in-service training and home school visitations, established a minimum of at least one positive contact in each school. By maintaining contact with this one person, my program is represented at the teacher or administrative level to several potential students.

The second most important action is student recruitment. I encourage students to have their friends and siblings visit my classroom for a day. I also recognize students who encourage and successfully recruit new students to enroll. The recognition comes in two flavors: public acknowledgement and extra credit as part of an Introduction to Occupations Module on Salesmanship.

Additionally, our BOCES has regularly scheduled 10th grade visitation days. During these visitations, several current students and teachers speak to all tenth graders at each member school district.

We also host BOCES visitation days where potential students spend a day in one or more classrooms at the BOCES Vo-Tech Center.

Our guidance department coordinates several guidance counselor meetings throughout the year where specific programs are emphasized.

I believe that it is up to the individual teacher to market his or her own program. This is done through the image the teacher creates among his or her peers and making use of every available opportunity for networking.

For Further Information Contact: Chuck Flint – Orange-Ulster BOCES
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BEST PRACTICES IN TECH-PREP

TITLE: Developing A Model Of Excellence Of Integrated Technical And Academic Curriculum Development
CONSORTIUM: Orange County Tech-Prep Consortium

Four years ago, Orange-Ulster BOCES had a Computer Repair Technology Program with an enrollment of seventeen students. The curriculum consisted of personal computer trouble-shooting by component replacement, digital electronics and assembly programming. It was a hands-on technical program with industry employment as its primary student outcome.

Today that program has grown to sixty-three students and is now called Pre-engineering. The curriculum has changed to integrate academic subjects through the use of Tech-Prep equipment and teacher training. Dual student outcomes of industry employment and college entrance are now stressed.

Technical reading and writing has been added to every lab and is counted as 10% of the total lab grade. In addition, each student is required to prepare one research paper each year, following MLA Guidelines. Each student is also required to deliver a five- to seven-minute presentation on a technical topic. Technical writing as a career is stressed. One member school district is currently granting English credit for students enrolled in this program.

Physics is taught over a two-year period, using CORD Principles of Technology equipment and classroom learning materials. Two member school districts are currently granting science credit for students enrolled in this program.

Occupational math is taught that includes portions of Courses One, Two and Three integrated into daily activity. Seven member school districts are currently granting occupational math credit for students enrolled in this program.

Introduction to Occupations One and Two are also integrated into the program. All 18 member school districts extend credit for students enrolled in this program.

In addition to Tech-Prep, the integration of academics into the technical program was fueled by an Industry Advisory Council. The twenty-member committee recommended the integration of Technical Reading and Writing and Physics as integral parts of the program.

Lastly, from thirty-three years of industry experience, I believe that academic skills will give a technician the impetus he or she needs to advance in an organization and enjoy a career and not merely an occupation.

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BEST PRACTICES IN TECH-PREP

TITLE: Ergonomics At Warsaw High School
CONSORTIUM: Genesee Region Tech-Prep Consortium

As an interdisciplinary project, nine Warsaw High School teachers were brought together to contribute their expertise to a project that would focus on the interrelationship of skills, much like in the work force. A curriculum was developed to be implemented in four stages with the students being supported by all faculty involved. It is essential that students work in all four areas to complete the project. This project targeted concepts in Technology, Applied Math, Business, and Applied Communication.

The overall task was for the group (cooperative learning) to use their combined skills to evaluate an existing office environment and make recommendations for improving the physical environment for maximum efficiency and comfort. The group was to redesign the office layout and make recommendations in a presentation. The group must have accountability for all recommendations to include: floor plans, charts, statistical analysis, surveys, and business correspondences.

Rubrics were developed for each of the requirements. The rubrics developed were for:

- a group oral presentation
- terminology
- group dynamics
- revised floor plan
- charts
- portfolio design
- self-assessment
- statistical analysis
- technical narrative
- original floor plan
- survey
- business correspondence
- annotated photo documentation
- daily activity log

These rubrics provided students with the criteria for assessment and method of evaluation that was very objective and well-defined.

This interdisciplinary project provides students with a foundation to develop most of the SCANS competencies from the level of awareness to mastery. Pairing with a business expert delivers the skills in the workforce application for the student. The variety of skills and the authentic approach provide a vehicle for transferability of the skills to the work world.

For Further Information Contact: Bruce Bergstrom – Warsaw High School
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BEST PRACTICES IN TECH-PREP

TITLE: A Hospital-Based School-To-Work Model
CONSORTIUM: New York City Technical College Tech-Prep Consortium

High school students enrolled in health care career clusters have chosen to prepare for an industry which is undergoing unprecedented change due to technological innovations, medical discoveries and cost containment strategies. These changes are redefining roles and responsibilities as well as relationships with coworkers and patients. As a result, student need has never been greater for up-to-date career awareness and development opportunities.

The New York City Technical College (NYCTC) Tech-Prep program has addressed this need by developing hospital-based work experience opportunities linked to school-based English curricula for Tech-Prep students enrolled in participating high schools which offer health care career clusters. Our program has adapted strategies developed by Project ProTech, a nationally recognized youth apprenticeship model which is directed by the Boston Private Industry Council.

In grade eleven, students are introduced to various health careers through hands-on departmental orientations at NYCTC and are offered opportunities to volunteer at participating local area hospitals. The science program covers medical laboratory techniques and histology/bacteriology. The English curriculum focuses on medical themes in literature (e.g. short stories by William Carlos Williams on his experiences as a general practitioner, Albert Camus' The Plague; movies "The Doctor," starring William Hurt; and television "E.R." and "Chicago Hope."

The grade twelve program, which includes coursework in anatomy and physiology, offers paid apprenticeship experiences utilizing funds available from existing work-based learning programs (Co-Op and the Training Opportunities Program); students are assigned to hospital departments, based on career interests, for ten hours per week after school. Tech-Prep English teachers, through Tech-Prep funding, accompany their students and observe first-hand their work-based experiences. They then integrate these experiences into their high school English curricula.

One of the more effective approaches used by English teachers at Clara Barton and Seward Park high schools involves the ProTech case study approach. Students are presented with symptoms from a fictitious patient. They are asked to present these symptoms to their hospital mentors and work through the procedures that would take place in their department in response to these symptoms. Students present oral and written reports in the English class which detail how their departments participate in the care of the patient.

In addition to developing basic skills and proficiencies, student participants develop a better understanding of the range of health career professions and the academic requirements and work place skills needed to succeed in these areas. They also develop a clear understanding of how a team approach is used to solve complex problems.

For Further Information Contact: Mike Frenkel – New York City Technical College
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BEST PRACTICES IN TECH-PREP

TITLE: Improvement Of High School Academic Performance
CONSORTIUM: Mt. Vernon Workforce Preparation Partnership

The June, 1996 graduating class of Mount Vernon High School had sixty-one Tech-Prep program completers. This class was the first class to complete the required two- or three-year sequence with the applied academics (or their equivalents) and receiving the supportive services from a Tech-Prep counselor in addition to their regular high school counselor.

A review of their academic performance at the end of twelfth grade shows a significant difference in the favor of the Tech-Prep program completers, when compared with the entire graduating class. The Tech-Prep '96 graduates had a senior year GPA of 2.96, while the entire '96 graduating class had a senior GPA of 2.47, a difference of 0.49.

This performance supports the central core of the Tech-Prep concept that the Tech-Prep student, the too often forgotten-average student, will benefit greatly from the additional supportive services provided by the Tech-Prep counselor and the targeted applied academics which is central to the Tech-Prep Program at Mr. Vernon High School.

For Further Information Contact: Ralph Tedesco -- Mt. Vernon City School District
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BEST PRACTICES IN TECH-PREP

TITLE: Instructional Materials Development Program That Emphasizes SCANS Outcomes
CONSORTIUM: Tech-Prep Consortium of Queens

In What Matters Most: Teaching for America's Future, "...about 10% of U.S. 17-year olds can draw conclusions using detailed scientific knowledge; just 7% can solve math problems with more than one step; only 7% can read and understand specialized materials; and a mere 2% can write well-developed material." This poor performance can be traced in part to textbooks and related materials that use Behaviorism-Sequentialism strategy for presented subject matter.

These text materials employ techniques such as constructivist, theme, multiple intelligences, cooperative, problem-based, interdisciplinary, and applied academics learning; writing in the content areas; and critical thinking elements. However, such books can only be of marginal help in increasing student SCANS-based performance since they continue to use Behaviorism-Sequentialism as their intellectual and operational framework.

What is needed are texts and materials that employ Cognitive-Analytic strategy. Tech-Prep teachers who now use such materials are able to directly, systematically, and seamlessly address student development of thinking, reading, and writing SCANS abilities – regardless of subject matter. Such integration is accomplished on a cognitive and operational level by seamlessly and naturally building associated student assignments directly into classroom discussion of course content. This best practice program develops such materials.

The program works as follows:

1. Across-the-curriculum faculty – elementary through college – are trained in Cognitive-Analytic strategy.
2. Faculty are provided with sample Whole Teaching–Whole Learning (WTWL) books, such as "Across-the-Curriculum Sampler - Ready-to-Use WTWL Classroom Materials," "ESL English Grade 11 - Read-to-Use WTWL Classroom Materials" and "Chemistry Grade 11 - Ready-to-Use WTWL Classroom Materials."
3. Faculty are provided with "Author's Guide for Developing WTWL Materials."
4. Faculty work with editors from the Tech-Prep project office and develop a 10-chapter book for courses in math science, English, business technology. electrical technology, and the social sciences. Each chapter contains many classroom assignments that engage students in thinking, reading, writing, and problem-solving within the context of course content.
5. The books are assembled and produced by the Tech-Prep project office and then printed and distributed to faculty for use in their classrooms.

The program requires funding inasmuch as faculty are paid to produce the textbooks and experts in WTWL are paid to edit the materials. The process is time-consuming as quality writing and editing requires dedication and attention to detail. However, the results in terms of student achievement are worth it. As of January 1997, about 20 content-area books are in development.

For Further Information Contact: Dr. Victor P. Maiorana–Queensborough Community Call
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BEST PRACTICES IN TECH-PREP

TITLE: Integrating Academic And Technical Education At The Two-Year College Campus
CONSORTIUM: Nassau County Tech-Prep Consortium

This best practice involves the integration of the technical and academic curriculum. The use of our expertly-constructed work-based applications has enabled students to apply what they learn in the classroom to real life. The practice began when faculty from the technical curriculum areas at the post-secondary level collaborated with Secondary academic teachers in the development of work-based applications to be used in the 11th and 12th grade Mathematics courses at the area high schools. Applications were developed in a variety of areas including Nutrition, Nursing, Office Technology, and Construction, to name just a few.

In using these work-based applications, students as well as teachers have noted that the relevance of the assignments have captured the interest of students who have been traditionally turned off in the classroom--those who have said "Why do I need this? I'm never going to use this in the real world." Connecting learning to real life career situations is long overdue and the students and teachers involved in these programs are excited and energized.

This practice was so well received that it has been adapted for use at the Two-Year College campus. A steering committee has been formed which is comprised of a core group of faculty members from the English, Mathematics, Health (Nursing, Dental Hygiene, Med Lab Tech, Nutrition), Business, Science, and Technologies departments.

The group has been working side by side in modifying and enhancing existing courses by incorporating contextual/applied and integrated learning methodologies and applications. For example, English assignments will include business writing, observational writing for the health careers and technical writing which is often used in the construction and electronics fields. Mathematics courses are focusing more on the career applications needed for success in the world of work. The work-based applications used are developed by the technical faculty to ensure accuracy and appropriateness to the career area. Collaboration and cooperation are the key elements to the success of these endeavors. Working together, academic and technical/career-focused faculty can make a difference. This innovative and novel approach to education at the post-secondary level will enable us to better prepare the workforce for the twenty-first century.

For Further Information Contact: Prof. Mary Stedman--SUNY Coll of Tech -- Farmingdale
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BEST PRACTICES IN TECH-PREP

TITLE: Math/Science/Technology Course As A Model For Additional Tech-Prep Courses
CONSORTIUM: Dutchess/Ulster Tech-Prep Consortium

In 1993, 3 Superintendents from the rural districts of Dover, Pawling and Webutuck organized interdistrict, interdisciplinary writing teams to create new Tech-Prep courses. Each new course would be designed to help students meet the new graduation standards which require more Math and Science of every student. In addition, a primary purpose of each Tech-Prep course was to integrate workforce preparation issues into the curriculum. The MST course was the first of these written by an interdistrict team of Math, Science and Technology teachers from these 3 districts. The process of writing the course has inspired the participating teachers; created new working relationships among administrators and teachers; generated measurable enthusiasm among students for additional applied math and science courses; increased teacher interest in writing new Tech-Prep courses for other disciplines.

Writing Process: 2 teachers from each district met once a month for an academic year and summer to create an initial design and to speak with employers, college faculty and a consultant. In the second year, the completed work was coordinated with Regents-level Math and Science standards. IBM-Fishkill supported hardware and furniture acquisition, and a local employer had a contest with a cash award for one of the projects. The teachers reported that designing this course has created an innovative atmosphere unlike anything they had experienced before. Teachers have reevaluated their methods in favor of authentic assessment.

Improved Relationships: The Superintendents and Principals have permitted the time release to write the course. They encouraged the team to attend related conferences, make presentations, attend training workshops, and other evidence of support. Principals facilitated common planning times and helped establish a new course sequence with MST as a Regents-level course in Math and Science. Restructured schedules, an integrated curriculum and shared decision-making have all contributed to a stronger alliance among teachers and administrators.

Increased Student Interest In Math & Science: During the third year of working together, the MST committee has piloted the complete course in each of 3 high schools where all classes had a mixture of ages and abilities. Each of the teaching teams learned that a project-based course with a true inquiry process for each student to take an active role in their own learning requires more time than they expected. Each of the teachers reported an increase in student enthusiasm and confidence as the projects became more challenging. Since the students want to continue in the course, the schools have decided to offer MST II which the same committee will design.

Increased Teacher Interest In Creating Additional Tech-Prep Courses: Teachers from Language Arts, Business and Computers, Social Sciences, and Art formed interdistrict and interdisciplinary teams to write 3 additional Tech-Prep courses following the MST model. The following courses are being piloted this year: Journalism/Social Sciences/Technology; Art/Technology; Economics/Math/Technology and MST II will be piloted in 1997-98.

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BEST PRACTICES IN TECH-PREP

TITLE: Monthly Career And Personal Development Seminars At The Community College
CONSORTIUM: Tompkins-Cortland Community College Tech-Prep Consortium

All high school students taking applied academics courses come every other month to the College for a day of activities related to their career plans. Business students and technology students alternate months. This is an excellent way to introduce students to the College in a non-threatening environment. College faculty members discuss issues in their fields and course offerings in their programs. Speakers from industry discuss resume writing, job interviewing, and their requirements for entry level applicants. The students themselves often organize the day's event, planning the agenda, and introducing the speakers.

This is a simple, low-cost effective way to (1) provide a strong program identity in students' minds; (2) allow them to feel positive about coming to college; (3) meet college faculty; and (4) provide thought-provoking information and exercises on career and personal development issues. It also provides an opportunity for teachers at different schools who are teaching the same subject to exchange ideas at lunch and throughout the day.

Cost to the program is lunch for the students, and in some cases the charges of the speakers. In many cases, the speakers are volunteers. The teachers are responsible for arranging busses from their schools and getting field trip permissions.

The following is a partial list of events that we have hosted at these meetings:

Job Interviewing Skills
Making a Decision About Your Future Career
International Business in Italy
International Business Program at TC3
AutoCad Demonstration
Sexual Harassment in the Workplace
Taking Control of Your Life
Managing Stress in Public Speaking
Learning to Relax
Math and Careers
Speaking for Yourself
Empowerment Workshop
The Path to a Career in Technology
You Can't Escape Speaking in the World
Non-verbal Communication
Electricity and Magnetism
Dressing for Success
Health and Careers
Communications Workshop for Teens
Success in the Classroom
Award Winning Electric Car
Stress Management
Business Program at TC3
Fashion Show
Math Anxiety Workshop
Communication Skills Workshop
Dealing with Difficult People
Financial Aid Workshop
Ethics on the Job
Word from the World of Work
Sex Equity Issues
Working in a Lab Environment
Learning to Manage Time
Overcoming Self-defeating Beliefs
Interviewing Skills

For Further Information Contact: Peggy McKernan -- Tompkins-Cortland Community College
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BEST PRACTICES IN TECH-PREP

TITLE: MST Careers Activities For Pre-Engineering
CONSORTIUM: Mid-Suffolk Tech-Prep Consortium

As part of the Mid-Suffolk Consortium's effort to develop a viable Engineering technical strand, the Bay Shore Union Free School District agreed to develop a series of applied math, science, and technology activities that would address essential skills, the new Regents standards (the standard college preparatory curriculum in New York State), and provide motivational learning opportunities for the Tech-Prep students.

A one-semester program was developed that included activities that highlighted the following:

- cooperative learning
- measurement
- kinematics
- vectors
- dynamics
- structures
- static equilibrium
- work, power & energy

An applied assessment was developed that students were required to complete at the conclusion of the first semester. The results have been extremely positive, with student motivation and success at an all time high.

The Mid-Suffolk Consortium is currently supporting curriculum development to provide a second semester follow-up.

For Further Information Contact: Gary Schechter -- Bay Shore Union Free School District
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BEST PRACTICES IN TECH-PREP

TITLE: Multi-Year Recruitment Process
CONSORTIUM: New York City Technical College Tech-Prep Consortium

Tech-Prep administrators and faculty members, who ask high school sophomores to make a four year commitment to a program, must recognize that promises often become distant memories two years later. Our experiences led us to recognize that Tech-Prep requires not only multiple entry and exit points but also multiple reinforcement points. The recruitment process which we now use has evolved into a multi-year plan which is designed to carefully target students who would most benefit from a four year articulated course of study which begins during the junior year at the participating high school and continues at New York City Technical College.

We have prepared recruitment packets for each participating high school which are designed for 10th grade students and their parents. Each packet contains the following items:

- Brochures - the City Tech Tech-Prep Program brochure and various college department brochures;
- The Tech-Prep Program - a description of the national Tech-Prep initiative, specific courses and activities offered through Tech-Prep and points to consider before answering the question, "Should I join the Tech-Prep program?"
- The Tech-Prep Contract - explains the importance of a four year commitment, asks the parent to closely monitor the child's progress and requires signatures by the student and parent.
- What is Advanced Standing? - explains articulation agreements and how to qualify for advanced standing credits;
- Student Survey - elicits student's college and career plans.

High school counselors conduct Tech-Prep recruitment workshops during Spring semesters in sophomore classes. Packets are distributed, the contents are explained and students are instructed to review the information with parents and, if interested in joining, return signed contracts. Selection is based on receipt of contracts, a review of high school transcripts and responses to the student survey.

We now recognize that once we have identified Tech-Prep juniors, our work has just begun. A number of program retention activities and services are provided for Tech-Prep juniors and seniors. They include: departmental tours; orientation workshops by college counselors and area employers; City University of New York (CUNY) college application and financial aid workshops; pre-testing of CUNY entrance exams and remediation workshops for students who fail one or more exams; advanced standing workshops for credits by examination or project-based assessment; a shadowing program where seniors spend a full day on campus with a Tech-Prep college student mentor; and pre-registration for incoming students.

As a result of these initiatives, the number of students who continue the Tech-Prep program at the college has risen from approximately 15% to 32%. We continue to strive for higher numbers. However, we recognize that plans change and , for many, other colleges may provide better options. Consequently, we believe that primary indicators of Tech-Prep success are that, for the 1995-96 academic year, 92% of our seniors graduated from high school in four years and 77% of our graduates pursued postsecondary studies.

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BEST PRACTICES IN TECH-PREP

TITLE: Planning A Business Conference
CONSORTIUM: Nassau County Tech-Prep Consortium

This cross-disciplinary project was designed for 12th Grade Tech-Prep students in the *Hotel/Restaurant* and *Office Technology* Tech-Prep classes and was incorporated into the curriculum. The project involves both groups of students working cooperatively to design and run business breakfasts or luncheons throughout the school year. It provides students with the opportunity to organize and host a business conference or meeting, invite guest speakers from the local business community to discuss pertinent business issues, prepare all supporting materials and documents needed to facilitate the conference, plan for food and beverage needs, analyze costs and practice display options, work cooperatively with another class, and participate in a real-world experience.

Before the unit begins, the teacher surveys local businesses by letter to gauge their interest in attending school-planned Business Breakfasts and discussing specific topics of interest. The teacher then arranges for speakers and the topic of discussion for each event. With the teacher's supervision students can plan to hold their first conference in November. As the school year progresses, teacher supervision decreases as students gain experience, and the final events are mostly student-organized.

Each event involves two or more invited speakers, students from the two courses and their teachers, two administrators, and an additional honorary invitee (Chamber of Commerce director, town Mayor, etc.) The teacher and students also invite a group of select students, possibly Tech-Prep Juniors, Business Education students, etc. to the event.

Each class has specific tasks to accomplish which relate to their career areas. All students meet to brainstorm and plan for each conference, tasks are assigned to be completed during class time, and all students again meet to approve or edit completed work.

The hotel restaurant students are responsible for arranging a buffet and individual place settings for attendees. This involves determining the food and beverages needed, determining costs, ordering/purchasing food and beverages from various sources, determining and purchasing supplies needed for the meal (coffee urn, plates, etc.), set-up of the designated room, table settings, greeting guests, and cleaning up. Time is allotted for informal chats, breakfast, speaker presentation, a question/answer period, and clean up.

Students in the Office Technology strand are responsible for composing the confirmation letters and invitations, name tags, agenda, food cards for display, thank-you letters, News Releases and publicity material, follow-up surveys, and reserving Audio/Visual equipment. These materials have to receive final approval from Hotel/Restaurant students and all teachers involved.

After the event, a follow-up survey designed by students before the event is distributed to all attendees. Results are used for discussion and improvement of subsequent events and grading.

By the end of the unit, students can work together to organize and plan for a business event with limited assistance from the teacher. This experience will enable them to enter a workplace where these planning and collaboration skills are required, and they have the background to handle their tasks professionally and effectively.

For Further Information Contact:Kathleen Sheehan or Bonnie Green-Tellerman-Mineola HS
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BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Pre-Freshman Transition Courses
CONSORTIUM: New York City Technical College

The "Great Thinkers" Tech-Prep Pre-Freshman English Courses were created in response to a question posed to the New York City Technical College (NYCTC) Tech-Prep curriculum development team. The question asked was, "If we could remove all logistical and financial impediments, what would the "ideal" Tech-Prep course look like that would help students make a seamless transition from high school to college?" What emerged was a "Great Thinkers" curriculum template which can be adapted to various settings based on course content interests and needs.

Thus far, we have developed two rigorous, theme-centered models: "Great Thinkers in Science" (e.g., Galileo, Darwin, Freud), and "Great Thinkers in Industry" (e.g., Ford, Taylor, Demming). These one-semester courses are offered to high school seniors for high school credit and are team taught by high school and college instructors on the college campus for three hours on Saturdays. These unconventional dynamics allow for the meshing of high school and college cultures and the utilization of multiple learning methodologies.

Each "great thinker" is explored through guest lectures and discussions, readings, writing assignments (using the format for the university's freshman skills assessment exam), lab experiences and field trips. For example, the Galileo unit includes a guest lecture, a whole class reading of the Brecht play, Galileo, a persuasive essay related to the Brecht text and replication of three of Galileo's original experiments at Barnard College's history of physics lab. The second half of each course centers around the development of group projects, related to a key concept proposed by a great thinker and applied to the student group's career cluster major, and group presentations to a panel of high school and college faculty.

The courses are designed, in the short term to prepare students for freshman skills exams and, in the long term, to develop college readiness skills and work-site competencies. Students receive an extensive introduction to college faculty members and facilities, develop familiarity with multiple-learn methodologies and instructional technology systems and develop an integrated knowledge base rooted in authentic applications. The "great thinkers" theme structure insures a high level of academic rigor, and the group projects component integrates academic and vocational skills.

The Saturday morning time block provides great flexibility for field trips, extended labs, movie screenings and other in-depth learning activities. The college setting offers access to state-of-the-art facilities such as the MAC physics lab, the college library and LANS computer writing lab. These "ideal" pedagogical conditions, however, produce additional funding demands (curriculum development, faculty time, field trips, transportation, etc.) which should be weighed before considering replication on a college campus.

Last year we introduced the "Great Thinkers in Industry" curriculum in an alternate week Co-Op English Section at a high school. While this format lacked several "ideal" elements, it did offer double periods of instruction, the class utilized a computer writing lab at the high school, and the course content was easily integrated into this work-based learning program. This pilot convinced us that the "great thinkers" design can be adapted effectively to a high school setting.

For Further Information Contact: Mike Frenkel
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BEST PRACTICES IN TECH-PREP

TITLE: Professional Staff Development Program In Cognitive-Analytic (Whole Teaching - Whole Learning) Strategy
CONSORTIUM: Tech-Prep Consortium of Queens

This program addresses improving student performance through professional development. It shows Grade 5 - 14 faculty how to move their instructional practice from Behavioral--Sequential to Cognitive-Analytic. For a discussion of the difference between the two, see Tech-Prep Consortium of Queens' Best Practices write-up "Teaching and Learning Based On Cognitive-Analytic Strategy." The program consistently receives the highest of ratings by participants, has been the subject of a CUNY Faculty Development Program and is being used by STW programs.

The program features one, two, three, or four-day workshops. The four-day workshop is a train-the-trainer program. The workshops are participant-centered and have these short and long-term outcomes:

Short-Term Program Outcomes: (a) an understanding of why the behavioral--sequential view of subject matter minimizes understanding, induces rote learning, and defeats the development of essential and critical abilities -- thinking, reading, writing, and problem-solving abilities, (b) the capacity to conceptualize subject matter cognitively, dynamically, and wholly, (c) an understanding of why whole analytical thinking leads naturally to the development of critical reasoning, reading, writing, and problem-solving abilities, (d) in-workshop development of materials for use in elementary through college classrooms.

Long-Term Program Outcomes: (a) the development in students of the ability to operate within an environment that prizes direct autonomy by providing them with necessary SCANS-based critical thinking, language, and learn-to-learn skills so they may increase academic performance, improve retention, and be prepared for the workplace, (b) prepare students for careers in a manner that will allow them and the organizations they work for to meet the economic, social, environmental challenges and responsibilities of the 21st century, (c) the development of textbooks and other materials based on Cognitive--Analytic strategy.

Here is a typical agenda for a 10-hour workshop:

- Registration
- How Do You Know When You Understand Something?
- Conventional Behavioral--Sequential Learning Versus Cognitive--Analytic Learning
- A Demonstration of WTWL Analytical Strategy Chapter 1, Teacher's Workbook for the Analytical Classroom)
- Experience-based and Text-based Analysis (Chapters 2 & 3 in the Workbook)
- Variations on the Analytical Theme (Chapter 5 in the Workbook)
- Development of an instructional set for use in the classroom
- Question and Answer
- Evaluation and Comments

For Further Information Contact: Dr. Victor P. Maiorana -- Queensborough Community College
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TITLE OF PRACTICE: Program Enhancements in Applied Math at Worcester Central School
CONSORTIUM: Tech-Prep of South Central New York

Tech-Prep offers the traditional Course I classroom a perfect opportunity to integrate Math, Science, and Technology using classroom discussions, problem solving and activities. Regardless of State requirements for the Regents class, we have found time to use the Tech-Prep materials to enhance enthusiasm and performance for learning. This is an alternate technique to Tech-Prep's Applied Math Courses.

Our Math, Science, and Technology teachers at Worcester Central School compiled a number of strategies, problems, and activities that can be used with grades 8-12. The compilation allowed our staff members to work together and improve student understanding of real world situations.

Keep in mind that we did not create many of the materials, but simply compiled them to help our classrooms come alive. We purposely kept our activities short and open so that teachers could adapt them to their individual needs.

Activities & Problems

1. Using a block of unknown substance, determine its density and predict what kind of substance it is (D=m/v). (This is a great way to begin evaluating expressions or formulas in Course I.)

2. The FCC recently ruled that radio station WRUN must decrease its broadcasting radius by 10 miles. Originally it had a listening radius of 65 miles. How many square miles will WRUN lose due to the FCC ruling? (This is a good application for the area of a shaded region.)

3. Determine the amount of almonds, cashews, and peanuts a company packages if the ratio must be 1:1:3 in order to make a profit. (Work backwards and compare companies.) (Ratios and Equations)

4. Collect temperatures of various classrooms (hourly). Graph the data. Calculate the mean, mode, median, and range, then discuss what might cause the variations found. (Statistics)

For Further Information Contact: David Ploutz -- Worcester Central School
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BEST PRACTICES IN TECH-PREP

TITLE: Providing Effective Professional Staff Development Activities/Programs
CONSORTIUM: Bronx Tech-Prep Consortium

Staff development within the Bronx Community College Tech-Prep program proceeds on an informal, uninterrupted basis throughout the school year. The Tech-Prep site coordinator, school supervisor (usually an assistant principal) in conjunction with the Tech-Prep student guidance counselor meet with the teachers who are teaching the Tech-Prep courses several times during a semester to review curriculum, plan special activities (e.g., career days, career fairs, job observations, etc.), and solve problems that occur within the program.

Within a similar context, teachers within the same academic discipline (math, science, communications) from all three participating high schools and guidance counselors from all three high schools meet at Bronx Community College to review program progress and discuss current issues related to student performance.

On a more formal basis teachers and counselors from the high schools and college participate in a two-day in-service summer institute at the Bronx Community College campus each year. This institute follows a similar format year-to-year, with topical variation in workshop presentations. The program begins with all participants gathered together in a large conference room and proceeds in the following manner:

Day One: Morning

1. An overview of current program activities is presented by the Tech-Prep Director and Coordinator.
2. An evaluation of program activities takes place with comments and contributions by all participants.
3. The program evaluator presents the group with an overall analysis of student performance.
4. A two-hour workshop is presented to all participants on such topics as teaching across curricula or portfolio assessment, by outside experts within the field.
5. Lunch

Day One: Afternoon

1. Curricula are reviewed by experienced Tech-Prep teachers in small group break-out rooms by subject area.

Day Two: Morning - Mid-Afternoon

1. High school coordinators present reports on the state of the program at their particular school and suggest activities for the coming year to entire group, for comments and suggestions.
2. A designated teacher from each academic discipline presents a report on the deliberations of the 11th and 12th grade curricula review groups..
3. Participants form break-out groups for two-hour workshops on such topics as "Developing Strategies to Increase Student Motivation." Each group consists of English, Math, Science, and Health Career teachers, counselors and a group facilitator.
4. A designated person from each break out group reports back to the general assembly on the group discussion, ideas, and concept development.
5. The institute ends with a luncheon, that provides a chance for social interaction among participants.

For Further Information Contact: Dr. Reid Strieby -- Bronx Community College
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BEST PRACTICES IN TECH-PREP

TITLE: Share Groups
CONSORTIUM: Oneida-Herkimer-Madison Tech-Prep Consortium

Teachers learn best from one another.

One teacher, who has participated in the Modern Manufacturing Institute Tech-Prep program for the past three years, has taken the initiative to form "Share Groups" of math teachers who are teaching Applied Math in our consortium.

She visits each teacher monthly, gathering information about what's happening in the Applied Math classes. (This teacher is able to make these visits because she is an Assistant Professor at the local community college and has some flexibility during the secondary school day.) She uses the feedback to put together bi-monthly "Share Groups" meetings.

During their meetings, teachers hear from a speaker on a subject of interest, and then break into "Share Groups" by topic to discuss the challenges and rewards of teaching in an applied manner. In the Spring, she hopes to interest these teachers in working on interdisciplinary applied projects.

Her classroom visits have

- done much to boost the credibility of the Tech-Prep program,
- helped secondary teachers better understand linkages with post-secondary education,
- contributed to better linkages between teachers in different districts, and
- strengthened the Applied Math classes by increasing the number of appropriate instructional practices in use.

For Further Information Contact: Marilyn Kelly -- Oneida-Herkimer-Madison BOCES
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BEST PRACTICES IN TECH-PREP

TITLE: Success Leads To Motivation
CONSORTIUM: Southern Westchester BOCES Tech-Prep Consortium

Planning time is necessary for collaborating teachers. The planning of a teaching unit by a team of teachers (vocational and academic) is a very crucial element for the success of our students. We have found that by integrating academics into the vocational program has provided an environment where students can be successful in both endeavors.

An example of the planning required to teach students in an Urban Forestry class about fire wood, would go something like this:

1. Identify student outcomes for the unit (vocational and academic).

2. Map out strategies that will be used to initiate interest, build skills, promote reading, writing, and math skills needed for the unit. (This is just a sample.)

3. Practice of skills (examples, hands-on, vocabulary, articles, math formula presentation, etc.).
   a. videos
   b. handouts
   c. recent articles brought in by students
   d. cut wood
   e. split wood
   f. determining number of cords of wood on truck
   g. etc.

4. Evaluation: Written and hands-on (team and individual).
5. Reflection (Portfolio piece on the unit by student. Suggestions on what they would change if they could do this unit over).

We have found that through this intensive planning process, we have been successful in motivating students. We have seen marked improved attendance and increased applications not only to 2-year colleges, but also to 4-year colleges related to career paths in this curriculum.

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BEST PRACTICES IN TECH-PREP

TITLE: Teachers Communicating Effective Teaching Techniques
CONSORTIUM: Greater Broome Tech-Prep Consortium

Practices that were developed to improve communication and benefit teachers and administrative personnel are monthly meetings of participating Applied Math consortium teachers and teacher presentations of successful applied academics.

Our monthly meetings among teachers fosters communication. Teachers discuss successful lessons, adaptations to existing materials, and concerns. These meetings provide ongoing in-service for teachers.

During the past three years, our meetings have also fostered an excellent working relationship among math teachers in seven participating districts and the community college. The Tech-Prep leadership looks to input from this group when making decisions. The group has worked together to write consortium finals for the applied math courses and have written Regents variances, which are applications for Regents course credit for applied courses. The Regents curriculum is the standard college preparatory program in New York State.

A practice that was developed to have a direct impact on administrative personnel was to invite a math and technology teacher to give a presentation to area superintendents and key business personnel about why applied academics is different from traditional, what works for students, and where we are going. Presentations explaining the differences between traditional and applied approaches to a given topic provide superintendents with new insight into the program.

For Further Information Contact: Phil Cali – Susquehanna Valley Central School District
Phone: 518-775-9146; FAX: -4575

BEST PRACTICES IN TECH-PREP

TITLE: Teacher's Role As Facilitator During Group Interaction In Math
CONSORTIUM: Greater Broome Tech-Prep Consortium

The hands-on approach taken in Applied Math is very motivating for students. They learn uses for the topics in the course and also learn to work together cooperatively, which seems to raise their interest and encourage them to solve problems.

In my class I act as facilitator and students learn much from each other. The technique that has helped the most with this is: when a student has a question, I may only be asked after everyone in the group has been asked the same question. This requires the students to work together and helps them to learn to communicate their ideas. Students realize that they are much more capable than they thought they were, and they develop more confidence in their mathematical abilities.

For Further Information Contact: Cindi Ford -- Whitney Point High School
Phone: 607-692-8201; FAX: -4434

TITLE: Tech-Prep Day
CONSORTIUM: Yonkers City School District Tech-Prep Consortium

Students enrolled in Saunders Trades & Technical High School's Tech-Prep programs in Bio-Environmental Technology, Chemical Technology, Computer Industrial Design and Electronics & Computer Circuitry are required to apply what they have learned in their technical area of study and academic subjects to a research/design project.

Students in Bio-Environmental and Chemical Technology programs are required to research a topic in their respective area throughout the school year. Students use and enhance the skills learned from their English and social studies classes to research a topic and write a technical report on a topic they have selected. Students then use the skills they have learned in the Chemistry/ Bio-Environmental program, mathematics courses and other science classes to design experiments to verify or demonstrate the results of their research. Students have done research projects in developing methods to determine the lead content of water and methods used to measure cholesterol in meat.

Students in the Computer Industrial Design program are required to manufacture a tool. Students use the skills they have learned in their academic subjects and the Computer Industrial Design program to research, design and develop manufacturing methods for the fabrication of a tool or mechanical device. Students will then use computer-aided design and computer-aided manufacturing equipment to design and manufacture their project. These students have designed and developed manufacturing techniques to manufacture arbor presses, hack saws and mechanical devices with gears.

Students in the Electronic & Computer Circuitry program are required to work in design teams. In these design teams, students will use the knowledge they have gained from the Electronics & Computer Circuitry and their academic subjects to research a problem, develop a solution, design a circuit, run computer simulations on the circuit they have designed, build a prototype and test the prototype. Then based on the test results, they will determine if the prototype requires redesign and the cycle repeated. These students have developed devices such as an anti-carjacking device, an extreme deceleration warning device used in automobiles, and devices to aid the physically challenged population.

At the end of the school year these students will present the results of their research/design project to engineers, scientists and researchers from industry and academia on what is called TECH PREP Day. TECH PREP Day is one of the major highlights of the school year. TECH PREP Day has been proven to be a great motivator for the students. It gives them an opportunity to apply what they have learned and show off their work to professionals from industry and academia.

For Further Information Contact: Jose Nunes -- Saunders Trade & Technical High School
Phone: 914-376-8150; FAX: -8154; e-mail: nunes@cloud9.net

BEST PRACTICES IN TECH-PREP

TITLE: Tech-Prep GURU
CONSORTIUM: Fashion Institute of Technology Tech-Prep Consortium

The GURU component of the curriculum utilizes a computerized career guidance program developed exclusively for FIT. It was conceived primarily as an educational rather than predictive tool. Using generic intelligence software, the program teachers students to assess their own unique self-profile and how the results correlate with career choices. The goal is to actively engage the students in making intelligent career decisions based on a thoughtful self-analysis and accurate occupational information.

The self-analysis aspect of the program consists of five steps.

Step 1: Looks at the interests of the student in six major areas and prints out a bar graph showing the relative strength of their interests in these six areas. The combination of interests is most significant in choosing a career direction. The interests correspond to the Holland Codes used in the Dictionary of Occupational Titles.

Step II: The students are asked to rank their abilities by assessing their current level of ability in nine important skills for each of their three highest interest areas. The program gives a printout.

Step III: The students assess their workstyle preferences or personality style. It is their Meyers-Briggs Indicator result. The computer prints out the appropriate profile in narrative form.

Step IV: The students are asked to rank their values and rewards on a scale and again a printout reflects their answers.

Step V: Ties it all together and a summary of their results is given. This marks the end of the assessment process and the students have a clear and succinct profile of themselves. The computer then matches this profile with that of over 100 occupations in the fashion and related industries. The students then get a printout of their matches listed from Best Match--Possible Match. The student can then get more detailed descriptions of what each of these occupations involve.

Students come to FIT to do this one-hour computer program. A detailed two-hour follow-up seminar is then held with a career counselor in small groups at the local schools. During the follow-up the rationale of the program is explained and students have the opportunity to modify or change information they had entered into the computer. The follow-up is crucial in helping the student understand the process of career decision-making. The information is shared with a counselor who may arrange internships to help them try out possible career choices in industry. Students constantly report that the program and follow-up are extremely valuable.

For Further Information Contact: Connie Passarella -- Fashion Institute of Technology
Phone: 212-760-7654; FAX: 212-594-4529

BEST PRACTICES IN TECH-PREP

TITLE: "Tech Wars"
CONSORTIUM: Niagara County Tech-Prep Consortium

The concept surrounding Niagara's "Tech Wars" competition was created and established by Bill Neidlinger, technology instructor, at Orleans-Niagara BOCES. During the school year of 1995-96 Bill used an electronics project in his digital electronics and other technology subjects in two school districts to spur interest in the event.

Students were each given a servo motor, which can be operated by a radio control device, much like the radio controlled cars and toys available in the consumer marketplace. Besides the servo motor, students also were given model wheels, a chassis, toothpicks, glue, axles, and other materials to build a personalized "tech vehicle." The class project devoted time in-school for each student to engineer their own project while learning how each component (servo's) operates. When each vehicle was finished, students would be engaged to enter into the classroom competition of "Tech Wars."

"Tech Wars" is a table top surface game. The table top consists of a flat table surface (8' x 4') which is separated by a small three-inch wall between two equal playing surfaces. The objective of the game is to retrieve a ping pong ball with the vehicle using the vehicle's arm on one side of the playing surface and drive the vehicle to the other end of the surface and deposit the ball into a triangular elevated surface which has a hole on the top level. The first vehicle, which is radio-control operated by each individual student, to complete the mission wins the flight.

During June, 1996, flight winners from each class assembled in the Technology Department laboratory at NCCC to compete in the county-wide competition. Each student battled the other in tight competition. The activity, which is a fun event for students, draws upon each student's individualism, since each "tech vehicle" is engineered by the student competitor. Each vehicle is unique and there are no wrong or right assemblies in creating the vehicle. Students were all given certificates for participation in the event and winners received sweatshirts and t-shirts for their efforts.

"Tech Wars" is a fun project, but it is also used to motivate students to understand the uses of technology and engineering. There are no wrong student-made vehicles, just poorly designed ones that can leave a student out of the competition.

For Further Information Contact: Bill Neidlinger -- Niagara-Orleans BOCES
Phone: 716-778-0130 or 716-731-4176

BEST PRACTICES IN TECH-PREP

TITLE: Using Problem-Solving Strategies
CONSORTIUM: Genesee Region Tech-Prep Consortium

Using cooperative learning techniques, students are grouped in threes and each student is asked to cut two pictures from a magazine. Then the group must invent a new object that incorporates parts of each of the pictures in the finished product. The finished product must be practical. A Systematic Problem-Solving video is viewed to help students understand the approach to problem-solving, brainstorming, appropriate communication, and teamwork.

Students are provided with a worksheet labeled with three columns: Solution, Pro, and Con. This offers some accountability and critical thinking as they work out their problem. Consensus rules!

A written evaluation of the cooperative environment is done as an observation form by the students. This includes ranking observations such as, "we worked and planned together," "took turns presenting ideas," "divided roles and responsibilities," and "suggestions how to improve activity."

All levels of communication skills are enhanced with this activity. Engaging the student in "real tasks" allows the student to acquire basic transferable skills. Student learning is impacted as the student application of these skills is evidenced in observation of the activity.

For Further Information Contact: Kathy McDonald – Attica High School
Phone: 716-591-0400; FAX: -2681

BEST PRACTICES IN TECH-PREP

TITLE: Windows To The World -- Doorways To The Future
CONSORTIUM: Finger Lakes Tech-Prep Consortium

Windows to the World -- Doorways to the Future is in its third year at Marcus Whitman Senior High School in Ontario County, New York. The program has changed an English 12 research project from a traditional research paper to a meaningful and personal School-To-Work experience for twelfth grade English students. All (Regents and non-Regents) students participate in interviewing, writing, speaking, mentoring, journal-keeping, research, and prepare a visual presentation of their final project based on the student's career, profession, hobby, skill or service of choice. The project begins in September and ends in mid-May.

The first step of the project for the students consists of selecting a field of study from an area of interest (career, profession, hobby, skill, or volunteer/community service). The student will then secure a mentor who's willing to allow the student to observe, interview, and possibly participate in the chosen field. The student must also conduct traditional research from books, periodicals, professional journals, audio-visual material, etc. The products each student is responsible for are:

a. **a 5-7 page researched, reflective, documented paper on the field of study,**
b. **a speech delivered to another group, either in the school or the community,**
c. **an exhibit to be displayed in May.**

Project Paper Requirements:

1. **5-7 pages, double spaced**
2. **Specific purpose/focus**
3. **Parenthetical citations from all works listed in the works cited**
4. **Works cited**
5. **Introduction**
6. **Topic sentence**
7. **Transitions to begin every paragraph**
8. **Specific examples, support, details from mentoring, interview, and research**
9. **Commentaries and discussion of each point**
10. **Correct spelling**
11. **Sentence variety using structures taught in class**
12. **Conclusion**

Senior Project Display/Exhibition Requirements:

1. **All seniors must have a display. Five grades of 0 will be placed in the 4th quarter average if a display is not done. In addition, any senior who has an incomplete in any part of the project will not be eligible for graduation.**
2. **Display tables must be covered with a tablecloth or fabric. Student will have 4' of table space.**
3. **Mentor's name and business must be displayed prominently and spelled correctly.**
4. **Dress appropriately -- professionally as possible.**
5. **Major points are deducted from project grade if senior is found anywhere except assigned section in the gym.**

For Further Information Contact: Dean Duffy -- Marcus Whitman Senior High School
Phone: 716-554-6441; FAX: -4882
or Bonnie Cosgrove -- Marcus Whitman Senior High School
Phone: 716-554-6441; FAX: -4882

APPENDIX B-A

DESCRIPTIONS OF BEST PRACTICES

APPLICATIONS TO ADMINISTRATIVE MATTERS

TITLE: Block Scheduling At New Berlin
CONSORTIUM: Tech-Prep of South Central New York

In the 1995-1996 school year, New Berlin Central School implemented a semestered schedule which allows students to complete full credits in a half-year's time. The schedule features four seventy-two minute classes and a study lab for all students.

This schedule has enhanced learning in all classes taking advantage of extended time on subject and fewer subjects to concentrate on at any one time. It has particularly benefited classes that are geared toward a more hands-on curriculum and has opened up longer and more meaningful internship possibilities. Several seniors had the opportunity to intern in child care, elderly care, business, law and physical therapy.

The early reports have been very positive. Through three quarters of the first semester the failure rates dropped significantly and the honor roll has grown by over twenty percent. New Berlin offers Tech-Prep courses in the areas of Math, Science, English, and Business. Along with other subject areas, semestering has allowed these courses to become more meaningful for our students.

For Further Information Contact: Steve Bradley -- New Berlin Central School
Phone: 607-847-6184; FAX: -6924

BEST PRACTICES IN TECH-PREP

TITLE: Computer-Aided Drafting And Design Program
CONSORTIUM: Niagara County Tech-Prep Consortium

Since 1982, Niagara County Community College and Newfane High School have been working on partnership activities which impact both high school and community college students. In 1995, 20 out of 30 incoming Computer-Aided Drafting & Design students at NCCC did not require an Introduction to CADD course. This response in meeting and exceeding the expectations of entering freshman students has been the work of Professor Donald Voisinet and Newfane CADD teacher Thomas Fare. Although not all 20 students originated from the Newfane School District, the other consortium schools have increased their enrollments in drafting and design courses.

Over the last five years faculty from Niagara County's consortium high schools and Professor Voisinet have been meeting to develop course curriculum, which has been in place for three years, but also they took time to evaluate the success and innovation required to keep the curriculum fresh and interesting for students. The process and products of their sessions have meant a total of five advanced standing classes which meet the entry expectations of college freshmen into NCCC's Department of Technology. Courses in Technical Calculations, Digital Electronics, Introduction to CADD, CAM Robotics, and Manufacturing Systems were developed to give students the ability to transfer into NCCC programs without remediation or review.

Topics such as 3D Design and modeling, along with system programming were content areas just for college students a few years ago. As a result of their program and course development, these subjects are now being introduced to high school students who have creatively developed some impressive mechanical drawings. Not only are their classroom projects impressive, but Niagara's Summer Internship Program has expanded because of the skills associated with student success on the job. Employers throughout the Niagara region have been extremely satisfied with student performance and, as a result, have developed paid co-operative positions for returning senior summer interns.

Employment opportunities for CADD graduates at Niagara County Community College have been 100 percent for the last five years. In fact, Thomas Fare (Newfane High School) and Professor Voisinet have been involved in school partnering activities resembling Tech-Prep since 1983. Through their efforts and hard work, the CADD program in the Tech-Prep consortium has been identified as one of the best 2+2 program systems in the area.

For Further Information Contact: Prof. Donald Voisinet -- Niagara County Community College
Phone: 716-731-3271 Ext 313
or Thomas Fare -- Newfane High School
Phone: 716-778-0130

TITLE: Forums
CONSORTIUM: Southern Westchester BOCES Tech-Prep Consortium

It is very important to include all stakeholders when considering a Tech-Prep initiative. Tech, home school, and postsecondary colleagues and administrators, business communities, and educational organizations, meet in a forum-like setting to discuss and brainstorm projects that are important to the development of our Tech-Prep initiatives.

At these forums we ask participants to identify the skills their future employees must have in order to be an asset to their company. We ask them to participate in curriculum development for that project, and to be available to students as mentors. We also ask them how we, as an educational facility, can better educate their future employees. It may surprise you that most businesses are happy to become our partner in education.

The most important qualities required for the future employee are:

1. Know how to learn
2. Be willing to learn
3. Have a good attitude
4. etc.

We need to revise our curriculum to reflect these needed qualities (SCAN Skills). By including relevant partners, our students can become the employees needed in today's competitive business environment.

For Further Information Contact: Ruth F. Richards -- Putnam-Northern Westchester BOCES
Phone: 914-248-2451; FAX: 914-962-4787; e-mail: RRichards@NS.Computer.Net

TITLE: Industry Fundraising
CONSORTIUM: Fashion Institute of Technology Tech-Prep Consortium

One of the most important strengths of FIT's Tech-Prep program is the commitment of the industries to the program's goals and objectives. In the first implementation year, two advisory groups were developed. The first, called the Executive Leadership Team, consisted of:

The President of FIT
The Vice President of Academic Affairs at FIT
The Dean of Business &Technology at FIT
The Principal of the High School of Fashion Industries
The Principal of Murry Bergtraum High School for Business Careers
The Director of Occupational Education, NYC Board of Education

The second was called the Industry Advisory Team and consisted of established contacts which FIT already had with industry. During the third implementation year of the grant, FIT assessed the effectiveness of this format and determined it needed augmentation. We added a third group earmarked to aid in fundraising endeavors as they may be needed for the future.

We reviewed the constitution of all three groups. The Executive Leadership team remained the same. In the case of the general Industry Advisory Team, we reconstituted it with people who had served as sponsors for the internship program. It became immediately obvious that they had a built-in commitment to the Tech-Prep program.

With regard to the third Fundraising Team, we asked the CEO of the company which had employed the greatest number of Tech-Prep interns to spearhead the fundraising drive. In order to support his efforts, we asked people to serve with him who had been defined as potential fundraisers.

We recommend this model as it has been most effective. We are assessing the results and will make changes as needed.

For Further Information Contact: Dean Nina Kurtis – Fashion Institute of Technology
Phone: 212-760-7838; FAX: -7593

TITLE: Marketing Approaches
CONSORTIUM: Niagara County Tech-Prep Consortium

According to a number of Tech-Prep researchers in the field and the Mathematica Policy Study, Inc., marketing efforts by national consortia have been one of the least funded budget areas of concern. Tech-Prep projects nationwide have spent less than 5% of their budgets on advertising and marketing strategies and/or products. Part of the problem associated with developing marketing plans is that they are time-consuming and costly if they are out-sourced to a provider of services. Brochure development, printing costs, distribution, video production, advertising, and sponsorship are all good ways to promote the project, but they can take significant funds to accomplish.

Niagara County has taken on the marketing effort by producing a variety of promotional materials to consortium schools and supporting agencies. A video was produced in 1993 and redesigned again in 1995 through the efforts of Niagara County Community College. Professionally produced videos can cost up to $10,000 to put together. The College provides the services through their Communications department as an in-kind contribution to the project, which makes it workable. The video provides information about the many courses and programs offered in Tech-Prep and is available to other community agencies who request a copy as well.

The consortium also developed new brochures which outline the three career areas of study available in the county. The three brochures were developed around a "icon" or symbol theme which relates to Engineering, Allied Health, Business/Office. A separate brochure which outlines the program basics was also developed using a curriculum model as a framework for students in 9th and 10th Grades. These "icons" were then used to assemble a newsletter which is organized and distributed four times a year. The newsletter provides information and stories about best practices and activities which take place in area high schools and the College as well.

The Tech-Prep director has also been a guest on the local community cable television station which promotes community events and programs throughout the county on a program entitled "Community Forum." This allows the message and purpose of Tech-Prep to be shared with a variety of people and provides more exposure to the efforts made. To date, three shows have aired which highlight the many programs, services, and community efforts made through the grant funding. It has also curved some misunderstandings about what the program is all about.

Lastly, the College's Institutional Advancement Office supports all Tech-Prep activities in terms of press releases and photos of events. Local newspapers have carried a variety of stories on Tech-Prep students, activities, and speakers which helps spread the good word about program benefits. A promotional program is hard work and takes away from other activities which might be deemed more important. But, if people are not aware of the work being done and given information about the project, support down the line becomes a harder bridge to cross without it.

For Further Information Contact: John D. Craig -- Niagara County Community College
Phone: 716-731-6222 Ext 412

TITLE: Marketing Tech-Prep To 10th Grade Students
CONSORTIUM: Mid-Suffolk Tech-Prep Consortium

In order to generate increased enrollment in the 1997-1998 Tech-Prep classes, Diane Trupia from West Islip High School spearheaded a marketing committee into action. The marketing plan included student-generated computerized posters, marketing brochure, entrance application, classroom presentations, and student interviews. The marketing committee consisted of Sheila Menielly (Business), Nancy Sybil (Math), Gary Peterson and Frank Mauceri (Science), and MaryClaire McCall (English). The plan went into action during the week of January 11 and was very successful thanks to the support of the English Department, Guidance Department, and principal, Ken Hartill.

Sheila Menielly and Diane Trupia worked on the promotional material. Sheila designed the application, and her Tech-Prep II students created and designed the computer graphics used on the posters. Using input from the Tech-Prep team, Diane created the marketing brochure and coordinated the schedule for presentations. Our English Department allowed the Tech-Prep team to visit all the tenth grade English classes to discuss the benefits of a Tech-Prep program; and the students were very receptive. Sixteen applications were received on the first day, and more are anticipated. After careful evaluation and consultation with Guidance, we are sure to see a significant growth in our upcoming enrollment.

For Further Information Contact: Jerilyn Ingold – West Islip Union Free School District
Phone: 516-422-1500 Ext 245

TITLE: Parent And Teacher Involvement In Tech-Prep At GMU
CONSORTIUM: Tech-Prep of South Central New York

Many programs are implemented in local school districts, but, in general, program success seems to be directly related to the amount of involvement of parents, as well as students, teachers, and the community. Making sure that the school and the community are aware of the plans and reasoning behind programming is essential, and this is the philosophy behind the way we have chosen to promote our Tech-Prep Programs.

Gilbertsville-Mt. Upton Central School District has implemented three Tech-Prep courses, CORD Applied Math I and II and Principles of Technology I, and has plans to implement two additional courses next year, CORD Applied Math III and Principles of Technology II. We are also involved in a Tech-Prep job shadowing program through Otsego County Office of Employment and Training. Tech-Prep has assisted us with solidifying two articulation agreements, one with SUNY Delhi for our Technology classes and one with Broome Community College for our Business classes. And lastly GMU is planning to pilot AIT Economics with our seniors in 1996-97.

Gilbertsville-Mt. Upton has been able to successfully implement these programs because of the tremendous effort of our administration to continually inform parents, teachers, students, and community members. They have publicized our involvement with Tech-Prep in as many ways as possible. Informal and formal presentations have been made to our Board of Education on a regular basis and to our faculty through monthly meetings.

We have also tried to encourage parents and other community members to become involved by holding various types of Parents' Nights during which Tech-Prep programming is discussed. Last year when we decided to implement the second course in the CORD Applied Math series and Principles of Technology I, we felt it was necessary to promote community awareness through a Tech-Prep Parents' Night. This meeting allowed people to view the materials to be used, speak to a trained teacher, and discuss the content of the course.

Our Principal holds monthly Parents' Nights to discuss a variety of topics of concern. Each year the Guidance Department Director gathers parents and students for a 8th Grade Parents' Night that focuses on scheduling courses for 9th grade. During these sessions, parents and students are encouraged to base their educational plans on the type of career in which they are interested, technical or professional. Since many of our students choose technical careers, courses that feature applied learning, such as CORD Applied Math, are in demand and are most appropriate for those students.

By using our District Newsletter and announcement system in the high school, we do our best to keep the community informed of new opportunities available to students through Tech-Prep. The ongoing communication that we provide through various forms--Board of Education presentations, parents' nights, etc.--is essential for our programs to be successful and therefore for our students to be successful. In a world where technology is constantly changing, students need to gain skills that allow them to be flexible workers and to readily embrace new technology. The Tech-Prep courses that we are offering prepare students to meet these challenges, and this type of knowledge is the best we can give to our students.

For Further Information Contact: Nanette Greeno -- Gilbertsville-Mt. Upton Central SD
Phone: 607-783-2246; FAX: -2254

TITLE OF PRACTICE: Student Management
CONSORTIUM: Syracuse City School District

Through the use of effective student management techniques, students are held accountable but also provided opportunities for success. A labor-intensive, personal system of monitoring students and communicating with parents and teachers is used to establish a set of expectations from which to operate. This is accomplished by the following practices:

Quarterly Report Card Review

The report cards of all students in the Tech-Prep Program are reviewed at the end of each marking period. Any student who falls below a grade of 75 in any academic subject is scheduled for mandatory tutoring. The tutoring schedule is sent home to the parent with the time and place listed for each tutoring session necessary for that child. The tutoring sessions are free of charge to the student, and attendance is monitored by the tutor who reports to the Tech-Prep office. Students who fail to report for tutoring or are failing two or more academic subjects are scheduled for a parent conference.

Attendance Monitoring and Phone Calls

Student attendance is reviewed on a daily basis. Attendance reports are issued by the attendance office each day providing information on the previous day's attendance for all students. The parent of each student in the program who missed any class during that day is contacted by phone. This lets parents know not only whether or not their child was in school that day, but also if he or she was in each class. The student is also contacted by one of the staff and is asked to verify his/her absence. A cumulative file is maintained on each student and discussions with parents and follow-up procedures with students are recorded.

Total Quality Management (TQM) Approach

We employ a Total Quality Management approach where all teachers, administrators, worksite coordinators, and support staff work together to support the student. Students have a Tech-Prep office which serves as a central point for them to go to for help with questions and concerns or just to "touch base."

The common core of teachers working with students and staff in a team approach allows for consistency in behavioral standards and academic expectations. The interdisciplinary standards, the active participation of all faculty and staff and the TQM approach provide the emotional and academic support necessary for each student to be successful.

Impact of these practices

- Attendance in the Tech-Prep Program is 94% compared to 88% for the overall school population.
- Graduation rates for Tech-Prep students are 96% compared to 85% for the overall school population.
- The percentage of Tech-Prep students passing English, social studies, math, and science at each grade level are consistently higher when compared to the total school population.

For Further Information Contact: Jane Greene -- Syracuse City School District
Phone: 315-435-6555; FAX: -5899

APPENDIX B-A

DESCRIPTIONS OF BEST PRACTICES

COMBINATIONS -- STUDENTS & FACULTY

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Applied Physics/Principles of Engineering
CONSORTIUM: Finger Lakes Tech-Prep Consortium

Applied Physics/Principles of Engineering is in its second year at Canandaigua Academy, Ontario County, New York. This program combines the Regents Physics and Principles of Engineering Technology courses into one 2-credit course with hands-on laboratory skills combined with theory. Students take the June Regents Physics exam and a local technology examination. Projects in mechanics, energy transfer, wave mechanics and introductory robotics are designed, constructed, and evaluated by each student.

The course is team-taught by a technology teacher and physics teacher in the technology rooms and the physics room. Students make the apparatus that is tested in the physics room. In technology the CAD system is used to design the projects, and the technology room is used for construction using wood, metal, and plastics. Evaluation is done using measurements collected from sensors attached to computers and efficiency is measured.

Benefits of the Applied Physics/Principles of Engineering Course:

Skills:

1. Students develop and demonstrate skills with research.
2. Students develop and demonstrate use of CAD systems.
3. Students develop and demonstrate use of machines in the technology lab.
4. Students develop and demonstrate collecting data with sensors.
5. Students develop and demonstrate ability to use data to evaluate performance.

MST Connections: Math, physics, and technology are integrated.

Connection to the Workplace: Field trips to engineering and manufacturing establishments are integrated into the curriculum. The course requires documentation and cooperative design.

For Further Information Contact: Donald Rensberger or Joe Leogrande
Phone: 716-396-3800; FAX: 3806

BEST PRACTICES IN TECH-PREP

TITLE: Automation Robotics/English 11B/Tech Course
CONSORTIUM: Monroe Community College Tech-Prep Consortium

Technology teacher, Ed Brady, and English teacher, Donna Murano, have developed the Automation Robotics and English 11B Integrated Student Task for Tech-Prep. During the 1995-96 school year, the class created a battery project. They designed a unit that would test batteries. They wrote surveys, wrote and designed commercials, wrote research papers on their findings, and performed other activities related to their project.

This year students are working together in teams of two to design a "pick & place" robot. The project requires students to design and construct a working model of a hydraulic robot for film packaging. The robot arm must efficiently and accurately load film canisters into their cartons.

With a partner, students are required to construct a hydraulic pick and place robot that can efficiently and accurately move an object from point A to point B, using given materials and their own ingenuity. They must analyze the specifications for the model, sketch, develop, and revise the model, considering its function, design, construction, and usability. While they are working, students are required to keep a daily log of progress, and compile a technical research paper about the robot project, including charts and graphs, and a work envelope drawing. Students then present their research and robotic arm to the class in a competitive situation.

Robots are assessed in terms of number of sketches and ideas considered, development of the model, effectiveness of revisions, function and design, durability of construction, and ease of operation. Group performance is assessed in amount of cooperation students show. Students' research papers are evaluated by their content (thesis, accuracy, thoroughness, development of ideas, use of research/source material), organization, documentation of ideas, style and mechanics (vocabulary, sentence structure, etc.).

This project provides students with a real workplace problem which allows for student choice and creativity as they evaluate a problem and assess a solution. It develops understanding through application of mathematical skills, and basic concepts, principles, and processes of life, physical, earth, space and information sciences and technologies in solving problems. The project gives students the opportunity to integrate their knowledge of physics, math, technology, and English. At the same time, students practice their writing and research skills, as well as refine their skills and knowledge related to Automation Robotics. Working collaboratively increases students' communication skills, allows them to operate as an effective contributing member of a team, and provides practice in managing themselves in relation to time and materials in order to complete a task.

For Further Information Contact: Bernadette Skobjak -- Olympia High School
Phone: 716-621-1000 Ext 2338; FAX: -6967; e-mail: bskobjak@greeceny.com
Donna Murano & Ed Brady -- Olympia High School -- Phone: 716-621-1500

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Basic Technical Drawing
CONSORTIUM: Genesee Tech-Prep

Consortium members worked with Genesee Community College Faculty to develop a basic technical drawing curriculum sequence that would provide successful completers of this course an advantage to transfer skills into the collegiate program. Students will be adequately prepared to continue study at the collegiate level, reducing remediation and enhancing student knowledge and skills.

The students will demonstrate an understanding of all basic concepts of mechanical drawing including multiview projection, sectioning, dimensioning, sketching, and pictorial view. They will develop skills using the alphabet of lines and lettering. The students will become familiar with and use different equipment in the drafting room and prepare for their further education at the post-secondary level.

This curriculum parallels the college course. College faculty and the Tech-Prep secondary teachers work closely to monitor and adjust to continue meeting college level requirements.

The performance and learning objectives are clearly defined for each unit. Suggested activities for meeting objectives are included.

In addition to the student acquiring some of the basic competencies and foundations of the SCANS, the student is prepared with a skillful level of technical skills resulting in a student with not only transferable, but marketable skills as well.

For Further Information Contact: Dennis Shine – Genesee Community College
Phone: 716-343-0055 Ext 6435; FAX: -0433

TITLE OF PRACTICE: Company Simulations
CONSORTIUM: Nassau County Tech-Prep Consortium

We have discovered that company simulations are an interesting way to bring the world of work into the classroom and to enhance student creativity. Groups of up to four students are organized in the classroom to create their own companies and products. Each company is organized into several divisions. Then the various written and oral assignments evolve naturally from interaction between divisions, and between companies and the public.

To demonstrate the process in the classroom, we first set up a model company with the class. A winning product for this company is a new and improved student desk and chair combination with all the accessories. This invariably stimulates their imaginations. Once accessories have been brainstormed, we discuss which ones should be kept on the list and why. Then we use free and focused writing techniques to help student groups establish their own products and companies.

Each company creates written and video advertising, and reacts to business problems posted on particular days. Most assignments in Tech-Prep English can key off these companies. Students who write "on the job" are not graded in terms of a C+ or B-. A report or letter can be either unacceptable, acceptable, or superior. A superior paper is of professional quality in content, arrangement, style, format, and mechanics. An acceptable paper has enough information, but contains a small number of easily correctable errors. An unacceptable paper either does not have enough information or contains major or excessive errors.

Company records include a file folder for each student which holds all assignments and revisions. If possible, all assignments should be typed or word processed so the students can develop a sense of professionalism. An example of point values for individual assignments might be:

Assignment	Unacceptable	Acceptable	Superior
1) Complaint Letter	0	1	2
2) Job Letter/Résumé	0	2	4

The total number of points earned in the project by each student can be translated into a conventional grading system.

When companies hold their meetings, students need to be sure that each company has a clear goal to be reached and that each student member has a specific job to be accomplished. A work evaluation of each member by other members of a company should be used in grading.

These company simulations challenge students and are effective in helping them use their knowledge and imaginations in thinking about solutions to real world problems.

For Further Information Contact: Jim Seeley -- Freeport High School
Phone: 516-867-5300; FAX: 379-7592

BEST PRACTICES IN TECH-PREP

TITLE: CORD Math I Successes At Cherry Valley-Springfield
CONSORTIUM: Tech-Prep of South Central New York

The CORD Math I course at Cherry Valley-Springfield Central School has been an effective program by bringing a well-structured approach to the classroom for struggling learners. The approach is exciting and helps students see relevance in their learning and helps them feel good about their success.

The CORD Math I program encourages teachers to extend the learning activities and tailor them to the individual students and their needs. In the graphing activities, for example, students worked with the computer program, Harvard Graphics, to convert their graphs to various forms of charts. Students discovered easier ways to give their presentations a professional appearance.

Another place to enhance the program is in Unit 7, Dealing with Data. The emphasis in this area focuses not on just doing the exercises, but on real life applications. Using Spreadsheets in MicroSoft Works allowed students a fast and easy way to see the effects of manipulating data. It's faster and more practical than the "paper and pencil" method. Using formulas and charts saved a great deal of time and showed students how success is the result of "working smarter" not "working harder."

For Further Information Contact: Kathy Walsh -- Cherry Valley-Springfield Central SD
Phone: 607-264-3265; FAX: -3458

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Global Studies-A Tech-Prep Perspective
CONSORTIUM: Finger Lakes Tech-Prep Consortium

This Global Studies course is taught in a laboratory setting at Marion Central School, Wayne County, New York. It is designed to give students the opportunity to practice and master the skills needed to be a successful and contributing member of our modern, democratic society. In the course, students actively work to master: problem-solving skills, critical thinking skills, information gathering/ research skills, and communicating/presenting skills. Although these are four general areas of skills, the course provides students with the ability to independently learn new skills and gives them strategies for learning new or unfamiliar information.

The course is in a laboratory setting. Most of the time students are involved with workshop activities using computers, telecommunications systems, audio-visual equipment, and other necessary hardware. The lab setting provides them with a "hands-on" place to practice skills, techniques, and methods to answer questions formulated in class.

The teacher-to-student ratio is relatively small in the course, which is designed for two teachers to be in the classroom, working with approximately 24-28 students. All students have access to the equipment. Each student is required to maintain a portfolio. The portfolio contains checkout tests on the equipment and a selection of finished work from each skill area. Students complete a final project which integrates skills from all four skill areas. At the end of the school year, all students take the Regents exam in Global Studies. Acceptable coursework is at or above the 85% level.

BENEFITS OF THE GLOBAL STUDIES LAB COURSE:

Skills: If all skills are mastered, students will be able to acquire other social skills on their own. Students learn to think critically and communicate for themselves. Students are given the chance to develop, learn, and practice those skills needed for them to successfully compete in the workplace. Students develop skills that encourage lifelong learning.

Heterogeneous Grouping: The use of a student-centered program aligns with upcoming state requirements for all students to be enrolled in Regents courses. Students are better able to enter the course from the local, Regents, or honors level. The course allows the district to meet the individual needs of students more directly than the traditional classroom. Students are able to take the course at the honors or Regents level, depending on their own effort, ability, and motivation.

Historical-Current Events Connection: A historical connection can be drawn to current events. Events happening today can be compared with events of the past. Examples include comparing the Persian Gulf War with past wars, linking the "ethnic cleansing" atrocities in today's Bosnia with the Holocaust.

Current Events: Students obtain first-hand knowledge of current events from several perspectives; newspapers, TV news, the CNN 4AM Internet daily update, and discussion with other students through the Internet link.

For Further Information Contact: Mike Smith or Valerie Chiarenzelli
Phone: 315-926-4228; FAX: -5797

BEST PRACTICES IN TECH-PREP

TITLE: GLOW Job Shadow Process
CONSORTIUM: Genesee Region Tech-Prep Consortium

The Genesee Region Tech-Prep, the GLOW (Genesee-Livingston-Orleans-Wyoming) School-to-Work Partnership, and the four counties' Business/Education/Council agencies joined forces to develop a region-wide job shadow process. The intent was to provide continuity throughout the GLOW area for businesses as well as the school districts.

The result of this endeavor provided all school districts with a process for job shadow placement of their students as they work to offer career exploration and workplace experiences to all students.

The Job Shadow Process packet has general and directive information for schools. It includes all the necessary tools for planning and implementation for job shadow placements. Brochures, sign-off forms, responsibilities of each partner, student and business training materials, sample contact and thank-you letters in addition to evaluation forms are color-coded for ease of dissemination.

Through the Job Shadow Process, teachers are developing working relationships with business and industry. In addition, this process provides the Tech-Prep student with an effective workplace learning experience.

For Further Information Contact: Betty Powers -- Genesee Community College
Phone: 716-344-5721; FAX: 716-345-1907

BEST PRACTICES IN TECH-PREP

TITLE: Improving The Number And Proportion Of Students Admitted To College
CONSORTIUM: Orange County Tech-Prep Consortium

In the three years the Pre-engineering Program has been in place at Orange-Ulster BOCES, the percentage of graduates who have elected to continue their education in a two-plus-two or two-plus-four program has grown from 17% the first year to a current 57%.

There are several reasons for this, such as updated curriculum, expanded industry involvement, articulation agreements and the availability of Tech-Prep funding. However, the primary reason is Orange County Community College's program, "Spend a Typical Day in College."

This program involves high school students spending a day at Orange County Community College and participating in two hands-on, college level laboratory exercises. These labs are taught by college professors, and the students receive a mixture of lecture and lab exposure. Several current college students are on hand to assist and advise the Vo-Tech students throughout the lab.

Feedback from this day is extremely positive. Comments such as, "It really helped my confidence to know that I can work at a college level," That was easy," and "That was fun" are typical. Last year when a second trip was offered to OCCC, nearly 100% of the students who had been there only a few months previously elected to attend again.

The cooperation between the faculties at OCCC and at Orange-Ulster BOCES is key to the success of this day. It requires multiple telephone calls, on-site visits, and detailed planning of the day's activities. The ends justify the means, however, as is significantly displayed by the increased number of students enrolling in college.

For Further Information Contact: Chuck Flint -- Orange-Ulster BOCES
Phone: 914-294-5431; FAX: -2619; e-mail: Chuckieabe@aol

TITLE: Mission Possible! At Quaker Publishing
CONSORTIUM: Monroe Community College Tech-Prep Consortium

Quaker Publishing is a school-to-work project that operates out of a technology classroom at Benjamin Franklin High School, Rochester, New York. During the 1996-97 school year we have been working with thirty 10th grade students registered in a full-year class.

The publishing center is equipped with 20 old but serviceable Macintosh LCs and 2 Power PCs. Every student has access to a computer and the applications needed to produce real world products. *Claris Works, Page Maker, Inspiration, Super Paint, Type Twister, Microsoft Office,* and *Photo Shop* make up our collection of software applications. We also have two scanners, three laser printers, a Risograph digital duplicator for high speed production, and a folder and stitcher for finishing brochures, newsletters and booklets.

Project-based learning, as well as real work, underlie the Publishing Center's relationship with the Monroe County Tech Prep Consortium. Unlike the business cards, note paper and fliers students have done for family and friends, products developed for the Tech Prep Consortium will be viewed by a statewide audience.

Since the final products are designed for a middle school audience, the high school students have begun working with middle school students and teachers to see what works and what doesn't work in the classroom. A parent survey/interview designed by Jefferson Middle School teacher Mary Ann Powderly is being produced by Franklin students for distribution to middle school students in Rochester and neighboring Rush-Henrietta school district. We are expecting to get over 300 survey interviews, which will be reviewed and tabulated by the Franklin students, with results published in the final booklet.

Since we began work on this project, the level of seriousness and dedication among our students has improved noticeably. Students are doing research, writing about their own career goals, and planning in advance for the production of a series of products including a classroom idea book for teachers, as well as a booklet that displays evidence of student work.

The project is funded in part by a Vocational and Technical Education Act (VATEA) grant and client work. Our biggest project this year is a contract from the Monroe County Tech Prep Consortium to develop career information for middle school students and their parents.

Another exciting activity for the Publishing Center students is a series of exploration days for middle school students at Monroe Community College. During these MCC workshops students, will be exploring career clusters with MCC students who are currently enrolled in a variety of programs. They will also learn to use the Internet to help with career choices.

Our theme, Mission Possible, is designed to engage both middle school and high school students in learning more about the career paths in technology, health and human services and communications, for the purpose of sharing that information with others. The idea of products -- books and a multimedia presentation -- that others will see, has proven so far to be a very powerful motivator.

In looking at the Tech Prep grant as a contract with a client, our students are beginning to see the importance of team work, planning, follow through, and self-direction. For many of our students, this is the first time they have looked at their school work as real work.

For Further Information Contact: Suzanne Meyer -- Consultant for Benjamin Franklin HS
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BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: The Paid Industry Experience: Communication = Success
CONSORTIUM: Fashion Institute of Technology Tech-Prep Consortium

Forging connections among team members, students, and industry, Tech-Prep is the catalyst for a great learning adventure. As each of these groups learns from the other, a continuous dialogue evolves, and that is the single most important factor in the success of the paid industry experience component of our program. The following links in our chain are interlocked, each equal in size and importance to the growth and strength of our students. Teamwork creates a solid foundation of support that reflects as these students graduate with greater career focus and professional confidence.

1. GURU, a computer career planning program developed by a team member at FIT, assists students in defining interests, abilities, workstyle preferences and values. In addition, it assists the Academic Career Advisement Specialist in matching students with industry sponsors.

2. Guidance counselors from the high schools provide significant insights relating to individual student strengths and needs.

3. Interviews with each student further expand this base of understanding, incorporating the student in the chain. These interviews provide a forum for professional development via resume, cover letter, and self-presentation critiques.

4. Two professional development seminars, with speakers representing many facets of the fashion industry, create career area awareness, and illustrate career paths. The interactive format provides an opportunity for students to hear first hand what skills and traits are important for hire.

5. On-site and written evaluations by work site supervisors define areas of student strength and weakness. This feedback facilitates perpetual curriculum development as well as individual counsel for students.

6. The work experience culminates in a meeting joining students, faculty, and the Academic Career Advisement Specialist in a discussion evaluating the experience from the student perspective. The students share experiences, accomplishments, and techniques for problem-solving.

7. Tech-Prep English teachers share insights gleaned from work experience journals with the Academic Career Advisement Specialist to aide sponsor assessment.

8. Industry speakers and sponsors often become a part of the Tech-Prep Advisory Board because of their tangible involvement.

9. Selected students are invited annually to participate in an advisory Board meeting.

10. Peer mentoring occurs when FIT Tech-Prep students speak to high school students at seminars, or when an older and younger student can be paired at a work site.

11. Tech-Prep students enrolled at FIT are asked to communicate their assessment of Tech-Prep's impact, as well as suggestions for the program to the Dean of Business and Technology.

12. Team directors periodically meet with Tech-Prep students enrolled at FIT to assist with transition issues, skill development and individual needs. The informal format also allows students to network.

Since most of our work experiences are in summer, the program assures continuity and an opportunity for practical application of learned skills. Our teamwork exemplifies that which we strive to teach, and together, students, team members, and industry join links to form a full circle.

For Further Information Contact: Rebecca Karpus, Academic Career Advisement Specialist
Phone: 212-760-7973; FAX: -7441; e-mail: fit-tp@worldnet.att.net

BEST PRACTICES IN TECH-PREP

TITLE: Reducing The Need For Remediation In College
CONSORTIUM: Bronx Tech-Prep Consortium

The Bronx Community College Tech-Prep 11th and 12th grade curricula in communications, math and science (i.e., chemistry and advanced biology) was designed to meet the standards of the CUNY college preparatory initiative (CPI). These are contextualized courses that include concepts, ideas, and problems from the fields of allied health and nursing. They were created to meet the concrete learning styles of the typical Tech-Prep student.

During the two-year high school part of this program, we administer the CUNY Skills Assessment tests to Tech-Prep students both in the 11th and 12th grades. These tests are scored and evaluated, thus allowing the Tech-Prep guidance counselor at each high school the opportunity to review the test scores with individual students and pin-point specifically where a student may need to improve their performance. These classes and testing procedures have allowed us to significantly reduce the amount of remediation needed by Tech-Prep students when they enter college.

For Further Information Contact: Dr. Reid Strieby -- Bronx Community College
Phone: 718-289-5227; FAX: -6031

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Reducing the Need for Remediation in College
CONSORTIUM: Tech-Prep Consortium of Queens

Background

The program features two elements: (1) use of Cognitive-Analytic to develop SCANs skills when engaging across-the-curriculum content, and (2) conducting dry-run college placement exams in the eleventh and twelfth grades.

Discussion

For a discussion of item 1 see the Tech-Prep Consortium of Queens' Best Practices "Teaching and Learning Based on Cognitive-Analytic Strategy" and "Professional Staff Development in Whole Teaching-Whole Learning Strategy."

Here is a discussion for item 2. Over 600 consortium high school students have taken dry-run college entrance exams in a program that involves parents. Dry-run exams are given in the eleventh and twelfth grade. This allows students two chances at the placement exams before they take the formal exams following high school graduation.

The testing program is very time-consuming and requires a great deal of preparation and follow-through. Consortiums considering implementing such a program must be willing to make the required commitment in time and effort.

Implementation

Here is a summary of how the program is implemented:

1. **During the 11th grade, the Tech-Prep project office personnel visit each consortium high school and administers a reading test and a writing test.**
2. **The Queensborough Community College Office of Institutional Research scores the exams and provides the results to the Tech-Prep project office.**
3. **The Tech-Prep project office communicates the exam results - by letter - to the students and their parents.**
4. **The letter includes information to students and parents on how to improve exam scores.**
5. **The procedure is repeated during the 12th grade.**
6. **Students take the official placement tests in June prior to entering college.**

For Further Information Contact: Dr. Victor P. Maiorana – Queensborough Community College
Phone: 718-281-5004; FAX: -5004

BEST PRACTICES IN TECH-PREP

TITLE: Using The Graphing Calculator For A Food Packaging Problem
CONSORTIUM: Nassau County Tech-Prep Consortium

Applied Math courses enable students to use their mathematical knowledge and reasoning to find innovative solutions to real world situations. Not only do they learn to devise a solution and justify their reasoning, but they can obtain feedback from outside sources about their problem solution. This gives students additional information and another perspective on things to be considered in solving problems.

In this project we used a graphing calculator to see if food companies minimize the amount of material they use to package their food without sacrificing volume. Previously, the students learned how to compute surface area and volume as well as how to use the graphing calculator to compute the maximum possible volume of a cylinder given a fixed surface area. First, the class was asked to compute the volume and surface area of two cylinders. One cylinder had a radius of 2 cm. and was 9 cm. high, and the other had a 3 cm. radius and was 4 cm. high. In their computations, the students discovered that despite the difference in surface area measurements, the volume in both cylinders was the same.

Students then considered several questions regarding which can was preferable. These questions required them to reason mathematically and explain their solutions. Then they derived equations to graph on the graphing calculator to find the height of the best cylinder. After a few examples, they discovered a pattern: the height of the cylinder with the minimum possible surface area will be approximately double the radius of the cylinder.

After completing this two-day (80-minute) lesson, the students were given a project to complete on their own. First they went to the supermarket to find a cylindrical can of food. Then they recorded the measurements of the cylinder, computed the volume, and wrote the equation to graph. They computed the minimum possible surface area, the radius and height to minimize the surface area. Then they judged whether their can had the minimum possible surface area, calculated how much from the minimum it was, and what adjustments the can company should make in order to lower the surface area and keep the same volume.

Next, the students wrote business letters to manufacturers of the cans informing them of the results of their calculations if surface area had not been minimized. They questioned the manufacturer about the reason for this, provided suggestions as how they could conserve materials, and other information they felt was important.

Upon completion of the project, the students were better able to see how the use of mathematical knowledge can positively impact the environment. In addition, communicating with manufacturers added another aspect to be considered in real life applications. In reply to one student's letter the manufacturer informed the student that although she was correct in her calculations, it was not possible to manufacture the cans this way because a substantial amount of extra material is required for the can end in order to form the double seam; therefore there is "lost" metal in the end, whereas there is no "lost" metal in the body. For this reason, cans are manufactured so that the ends are smaller in diameter than body height. While the reply did not contain the manufacturer's calculations, it provided an opportunity for students to see that there are other aspects of the situation of which they were previously unaware, and had not been considered in the classroom.

For Further Information Contact: David Hyman -- Mineola High School
Phone: 516-741-4192; FAX: -1860

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Work Experience For Business Students
CONSORTIUM: Tompkins-Cortland Community College Tech-Prep Consortium

Eleventh and twelfth grade students in the Tech-Prep business program are required to work with a local employer for a minimum of 8 hours per week, and to take a supporting class which meets one period per day to help them be successful in their jobs. There are currently five schools and 82 students participating in this program.

Work begins in the Spring of the 10th grade when students sign up for the program. Teachers work with each student (and often his/her parents) to determine the kind of work the student should seek. The teachers have made contacts with businesses in their communities, and for the most part, found employers receptive to hiring a student. In marketing the program, we point out that employers are not hiring "just another high school student;" they are hiring someone who will be supported in school in developing the skills needed for that job. The arrangement is a partnership of the employer, teacher, student and parent. The program also allows employers to develop a good public image, and we ensure that the list of participating employers is shown throughout the community. Employers are required to pay minimum wage.

Teachers work with the students to create their resumes and to develop good interviewing skills. Once the student has been offered the job, the teacher meets with the employer to complete a training agreement listing the skills the student needs. Each student is assigned a worksite mentor to support him or her. The program runs training sessions for worksite mentors to help them work with young people.

The teacher then monitors the arrangement through monthly calls to site visits to the employer. After the first 60 days, the employer completes a progress report for the student which is used to define areas of weakness and to help compute the grade the student receives in the school course.

All students in the business program get together every other month at the community college for career and personal development seminars.

For Further Information Contact: Peggy McKernan --Tompkins-Cortland Community College
Phone: 607-844-8211; FAX -6535

APPENDIX B-A

DESCRIPTIONS OF BEST PRACTICES

COMBINATIONS – STUDENTS & ADMINISTRATIVE

BEST PRACTICES IN TECH-PREP

TITLE: Little Apple -- A Student-Run Business
CONSORTIUM: Cattaraugus-Allegany Tech-Prep Consortium

The Cattaraugus-Allegany BOCES Center at Olean, in conjunction with the Tech-Prep Consortium, has created a student-run business in downtown Olean known as "Little Apple Enterprises." The business's name is derived from the notion that Southwestern New York has many of the amenities of the "Big Apple" but on a much smaller scale.

Little Apple is a unique gift shop run by students from the BOCES Business Technologies classes. The students are bussed directly to the store and spend two and one-half hours per day at the site (Seniors in the mornings, Juniors in the afternoons). They study business practices, accounting, word processing, desktop publishing, along with various retailing techniques, including window display, merchandising, customer service, advertising, promotion, and inventory control. Students participate in paid work experiences by working at the store after school, evenings, and weekends.

The store is a showcase for locally-produced merchandise, including paintings, prints, pottery, sculpture, wood crafts, stained glass, t-shirts and sweatshirts, maple products, gourmet coffees, candies, ice cream, jams, jellies, preserves, and much more. All told, Little Apple represents over 70 local vendors, from large corporations to cottage businesses. A specialty is the local gift basket, created to the customer's specifications in any price range.

In addition to giving students real-world training in all aspects of running a business, Little Apple provides local artists, artisans, and manufacturers with a place to show their products. It is also a tourist attraction which promotes the greater Olean area. On a seasonal basis, Little Apple participates in local promotional events, art shows, and features a monthly meet-the-artist series at the shop.

Funding and material support for Little Apple Enterprises has come from a variety of sources, including the Tech-Prep Consortium, BOCES Adult and Vocational Education, Greater Olean Inc. (Chamber of Commerce), Community Bank NA, and Cooper Power Systems Division of Cooper Industries.

For Further Information Contact: Larry Sorokes -- Cattaraugua-Allegany BOCES
Phone: 716-372-8293 Ext 288
or John Shortencarier -- Little Apple Enterprises
Phone: 716-373-7420

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Manufacturing Career Awareness Program
CONSORTIUM: Central New York Tech-Prep Consortium

The Manufacturing Career Awareness Program, sponsored by Liverpool High School, United Auto Workers Local 264 and New Process Gear is a true collaboration of Tech-Prep faculty, industry and labor. The project was piloted in July and August, 1996 and has proven to be a model of excellence in Tech-Prep for a number of reasons. First and most importantly, there is documented evidence that this very effective workplace experience has improved student motivation toward school as evidenced by an increase in G.P.A. and less absenteeism among students participating in the program. Faculty and industry worked hand-in-hand to create a program which embodies applied curriculum, integrates technical and academic areas, and successfully exposes students to the rapidly changing technology of manufacturing in today's world. The commitment on the part of UAW Local 264 and New Process Gear is evidenced by a significant in-kind contribution and a willingness to take the lead role in disseminating information to other business/industry groups and encouraging them to institute similar programs; even offering implementation assistance. The Manufacturing Career Awareness Program is the cornerstone of a program for long-term support of the Tech-Prep program in this consortium.

The Liverpool School District provided a technology teacher for the course work, a program coordinator, transportation for students to and from New Process Gear, and a certificate of liability insurance with NPG as the holder. The Tech-Prep Consortium paid $3,640 of the $10,360 cost of the program and the school district paid the remainder. the UAW Local 264 and New Process Gear added to the total cost of implementation of the program with a sizable in-kind contribution.

The program begins with a parent meeting which provides an overview of the Manufacturing Career Awareness Program followed by a Student Orientation Tour. During the five-week-long course for which students earn 1/2 Carnegie credit, 24 eleventh and twelfth grade students are on-site at the New Process Gear facility from 8:00 a.m. to noon, Tuesday through Thursday. Students punch in with specially-issued identification and time cards and meet in a classroom on the production floor where they receive their assignments for the day. The next part of their day involves shadowing employees in the areas of Research and Development, Product and Manufacturing Engineering, Assembly, Production, Management/Union Relations, Maintenance and Rebuilding. At the end of the program, each student will have been exposed to eleven shadowing experiences for a total of 30 hours per student. Following the shadowing sessions, students re-convene to critique the day's experience and to hear a guest lecturer. Students keep journals and write daily "Shadow Experience" evaluation sheets for the instructors. Students meet with Human Resources personnel to fill out job applications, participate in interviews and receive feedback on their interview performance.

The applied "hands-on" curriculum of the Manufacturing Career Awareness Program, which was jointly developed by technology faculty and employees of New Process Gear, is built on NPG's philosophy that teaches students the importance of high-tech, communication, and problem-solving skills in a team environment, the profile for success in today's manufacturing world.

For Further Information Contact: Marcia Drumm – Onondaga Community College
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BEST PRACTICES IN TECH-PREP

TITLE: Workforce Development System
CONSORTIUM: Finger Lakes Tech-Prep Consortium

Level of Involvement: Each business will indicate the level(s) of interaction they are willing to commit to initially. Students will progress through a sequenced program that increases responsibility and commitment at each level for both the student and the business; Tours, Shadowing and Mentoring, Internships, and Work Experiences.

Population Included: Tech-Prep students from local school districts. The districts will identify eligible students based on their definition of a Tech-Prep student. All students will be in courses that integrate workplace and life skills into the curriculum and will be enrolled in Tech-Prep core academic classes.

School-Based Learning: , Local districts provide programming for Tech-Prep students that fosters communication, math, science, and technical skills. Teaching methodology encourages contextualized learning as a basis for problem-solving.

Work-Based Learning: The workplace provides students with training/information on safety and hazardous material handling as practiced at the work site. The business assists students in obtaining a keener awareness of teamwork and practical applications of quality concepts as utilized by the company. Specific technical training will be sequential as the student progresses from level 1 to level 4 of the program. The business interviews students for acceptance into levels 3 - 4 of the program. The interview is viewed as a mechanism for validating the behavioral and technical/academic skills the student has acquired.

Training for Student Work Supervisors and Educators: Each member of the partnership designates one person as a contact within their organization. Each designee is invited to spend time in the other's arena to develop an understanding of the work/educational environment. The partnership provides training for the contact people and their designees as requested.

Reward and Recognition: Students in levels 3 and 4 of the model can earn credit for their experiences. The amount of credit received is related to the number of hours the student participates in the experience and the school-based responsibilities related to the work experience the student completes. Recognition for all participants in the partnership and the program is desirable. The partnership initiated the program with a reception that included students, parents, business representatives, and educators. The reception generated awareness of the program, acknowledged the partners, recognized the students and informed all parties involved. As the program progresses, each partner will provide public relations releases to their company/school newsletters, and local community newspapers.

Validation and Measurement: Records of program participants are collected, compiled and recorded. The number of students who enter the workforce are determined. Certificates are awarded at each level of attainment. Final certification depends on industry standards.

For Further Information Contact: Rebecca Gamba -- Finger Lakes Community College
Phone: 716-394-3500 Ext 420; FAX: -5005

APPENDIX B-A

DESCRIPTIONS OF BEST PRACTICES

COMBINATIONS -- FACULTY & ADMINISTRATIVE

BEST PRACTICES IN TECH-PREP

TITLE: Business/Industry Collaboration In Tech-Prep Curriculum & Program Development
CONSORTIUM: Mid-Suffolk Tech-Prep Consortium

The Patchogue-Medford Tech-Prep Technical Electronics program has successfully developed a new curriculum on Computer Technology with the assistance of the Long Island company, Imperial Software.

During the first six weeks of the Fall semester; the Patchogue-Medford High School Technical Electronics Class (19 students) is housed at the Imperial Software corporate headquarters. This allows the students to learn in an industry environment, which is supported by a number of assigned Imperial Software technicians who work directly with the students and their teacher.

The curriculum for this course was developed during the previous Summer with active collaboration by representatives from Imperial Software, BOCES, and two additional Tech-Prep Consortium districts.

The students are block scheduled during the first quarter of the school year to permit them to spend one-half of the day at Imperial. Upon conclusion of the six-week experience, the students return to Patchogue-Medford High School, but maintain contact with the Imperial Software technicians via the Internet. Imperial Software facilitated the upgrade of about twenty 386 IBM computers that had been donated as excess equipment by the Chase Manhattan Bank. These computers not only linked the school to the industry site, but computers were also given to parents to help them monitor their son's or daughter's progress through a special Internet-based software.

The upgrading of these donated computers was also included as part of the students' learning process. Tom Murphy, Imperial's CEO, has stated that his company's primary motivation was to help create the kind of skilled employee he was having difficulty in locating.

For Further Information Contact:Philip Pennisi -Patchogue-Medford Union Free School Dist
Phone: 516-758-1010

BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Coordinating Professional Development with School-To-Work Programs
CONSORTIUM: Tech-Prep Consortium of Queens

Background

The Tech-Prep Consortium of Queens (TPCQ) and the Queens School-To-Work Initiative (QSTWI) have formally agreed to conduct a joint professional and materials development program in Cognitive-Analytic2 strategy for elementary, middle, high, and college math teachers in the Spring of 1997. Given the availability of funding, this program can be extended to all STW teachers at all levels. this program will concentrate on the math curriculum.

Discussion

Two strategies that are used in education at all levels, Behaviorism and Sequentialism, are ineffective for learning, especially when a student has not had adequate preparation in a particular subject. Behavioral learning objectives are a useful management tool. They describe what a student should know and be able to do once a topic has been covered. However, they do not promote understanding of the subject matter to be learned, and do not suggest ways to fill in gaps in a student's knowledge to enable the student to connect new information with prior knowledge. Sequentialism is the serial arrangement of subject matter topics – as in textbooks – without making dynamic intellectual connections within and among topics. This causes students to see learning as an act of memory and not analysis.

On the other hand, Cognitive-Analytic strategy and practice provides: (1) the underprepared student with another chance at school success because it draws on little-used intellectual abilities shared by all humans, (2) the ESL student the opportunity to use their innate intelligence, and (3) directly helps all students to develop essential and critical thinking, reading, writing, and problem-solving abilities. See Tech-Prep Consortium of Queens' Best Practices "Teaching and Learning Based on Cognitive-Analytic Strategy" for additional discussion.

Implementation

Implementation of Cognitive-Analytic strategy for grades 5 through 14 is accomplished through a professional development program and through the development and use of instructional materials that employ the strategy. For a discussion of the professional development program, see Tech-Prep Consortium of Queens' Best Practices "Professional Staff Development Program in Whole Teaching-Whole Learning Strategy."

Here is the agenda for the math-based TPCQ and QSTWI professional development program:

On-Site (6 hours)

- Registration
- Introduction to the Tech-Prep and School-To-Work Programs
- How Do You Know When You Understand Something
- Conventional Behavioral-Sequential Versus Cognitive-Analytic Views of Subject Matter
- A Demonstration of WTWL Analytical Strategy (Chapter 1, *Teacher's Workbook for the Analytical Classroom*)
- Experience-based analysis (Chapter 2 in the *Workbook*)
- Variations on the Analytical Theme (Chapter 5 in the *Workbook*)
- The elements of an instructional set (distribution and discussion of sample sets)
- Question and Answer
- Identification of the mathematical theme for which 8 instructional sets will be written
- Evaluation and Comments

Off-Site Materials Development (approximately 25 hours)

- Faculty develop initial drafts of instructional sets (April 30, 1997)
- Faculty, TP, STW project offices review al sets (May 16, 1997)
- Sets made available for use in classrooms (September 1, 1997)

For Further Information Contact: Dr. Victor P. Maiorana – Queensborough Community College
Phone: 718-281-5004; FAX: -5004

TITLE OF PRACTICE: Communication
CONSORTIUM: Syracuse City School District

A primary goal of the Tech-Prep Program is to maintain open communication. Through well-established communication networks, parents, students and teachers are provided information regarding student attendance, academic progress and program updates. This is accomplished by the following practices:

Newsletter

A quarterly newsletter is prepared to the Tech-Prep staff in order to communicate pertinent information about the program and its students. The newsletter lists: dates and times of tutoring programs, national test dates, student achievement and honors, student internship experiences, interviews with students, information about courses, articles on study skills, notices of conferences and information on new directions in Tech-Prep. The newsletter is distributed to all parents, teachers and Tech-Prep staff.

Student Interviews

Formal student interviews are conducted on a yearly basis by the Tech-Prep staff members. Students are asked career related questions to help align their academic program of study and internship experiences with their career interests and goals. Career planners are revisited and revised if necessary to meet student needs. Suggestions are made to students at this time to help them increase academic achievement like attending tutoring sessions and/or seeking help from staff members.

Senior Surveys

At the end of their senior year, students are administered a career maturity and attitude survey. The evaluation includes questions assessing student career maturation, career orientation, career skills transference, and career confidence. A control group of non-Tech-Prep students are also surveyed. The data from the surveys is compiled and compared. Tech-Prep students consistently score higher than non-Tech-Prep students in the areas of career decisiveness, career involvement, career independence, career orientation, and career compromise. Information from the surveys are shared with the students so that they have a personal assessment of their strengths and weaknesses in the areas evaluated, as stated above. The information from the surveys, along with the comments from the students are used to evaluate the program and make changes if necessary.

Staff Development and Communication

From the inception, teachers were included in developing the Tech-Prep Program and curriculum. Teachers attend conferences and workshops, and are exposed to current research in education and school to work practices. Dialogues between staff and business partners led to the framework for the Tech-Prep curriculum. During the school year, time and opportunity are provided on a biweekly basis for enrichment activities including speakers and videos or learning styles, learning disabilities, and inclusion classrooms. This forum allows for consistent teacher to teacher communication which has produced program innovations including block scheduling, interdisciplinary teaching and integrated thematic units.

Impact of these practices

- improved collaboration between staff members and business partners.
- effective professional staff development activities and programs.
- improved integrated technical and academic curriculum development.
- strong parental support for the Tech-Prep Program.

For Further Information Contact: Jane Greene
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TITLE OF PRACTICE: Tech-Prep Recruitment and Promotion
CONSORTIUM: Syracuse City School District

The recruitment and promotion of Tech-Prep requires a comprehensive approach involving a variety of strategies at many different levels. We accomplish this by the following practices:

Eighth Grade Classroom Visits

In the eighth grade, guidance counselors meet individually with students to develop career planners which outline academic paths and career goals. Before this process begins, all eighth grade science classes are visited by the Tech-Prep worksite coordinator who provides students information about what Tech-Prep is, what it has to offer, and how to sign up for it.

Career Planner Nights

In conjunction with the classroom visits, the Tech-Prep worksite coordinator promotes Tech-Prep by participating in the career night workshops held at every middle school in the district. This event provides an opportunity for parents as well as students to access up-to-date information on the program and related careers. Brochures and pamphlets about the program are also available.

Guidance Counselor Workshops

The Tech-Prep staff regularly conducts workshops for middle and high school guidance counselors. These workshops provide information about:

- **new program initiatives**
- **new courses available through Tech-Prep**
- **two-year technical programs available for students**
- **how to promote Tech-Prep to all parents and students, including the minority and special needs population**

Parent Orientation

During the last week in June, parents of all incoming Tech-Prep students are invited to attend an orientation at the high school. At this time, information about coursework, student expectations, attendance, and required internships are explained. Students and parents have an opportunity to meet the Tech-Prep administrators, teachers, and staff. Upperclassmen in the program are introduced and share their experiences about Tech-Prep and their internships. The orientation concludes with a tour of the building conducted by the Tech-Prep students.

Impact of these practices

- **increased access to Tech-Prep for all populations**
- **improved student motivation toward school**
- **improved applications of career majors and educational path planning**
- **higher numbers of students choosing a course of study in fields related to their interest-centered curriculum**

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APPENDIX B-A

DESCRIPTIONS OF BEST PRACTICES

COMBINATIONS -- ALL THREE CATEGORIES

TITLE: Dresser-Rand/Tech-Prep Project
CONSORTIUM: Southern Tier Central Tech-Prep Consortium

The Project Description: Tech-Prep students work in teams to calculate the specifications for the placement of bolt holes on a 5¾" metal disk used on the manifold of a gas compressor manufactured by Dresser-Rand. The project involves four subject areas as follows:

1. **Mathematics - the students learn right angle trigonometry so they can calculate the placement of the bolt holes on the disk.**
2. **Science - the students learn about cutting tools and the relative properties of the cutting tool and the machined part.**
3. **Technology - the students use computer technology to draw the part, they learn about feeds and speeds for the machine tool, and they machine the part within the specifications of the project.**
4. **English - the students prepare technical reports using the Dresser-Rand format.**

The Project Process:

1. **Planning Workshop at Dresser-Rand: Tech-Prep teachers are invited to participate in a one-day planning workshop at Dresser-Rand. They must apply as an interdisciplinary team. Each team works with a facilitator from Dresser-Rand and they learn the project and plan how they will teach the project in their school. Dresser-Rand supplies materials and equipment for each school team.**
2. **Project Teaching: Each team implements their teaching plan with their Tech-Prep students.**
3. **Machining: Each school group visits their local BOCES precision machine classroom to machine their part under the supervision of Dresser-Rand machine tool experts and a BOCES instructor.**
4. **Technical Report: Each school group completes their technical report(s) which they submit to the Dresser-Rand Technical Writing staff for review and comments. If time allows, they are returned to the school to be corrected and resubmitted.**
5. **Dresser-Rand Visit: After all the projects have been completed, the school groups all visit Dresser-Rand together for a one-day program that includes employment information at Dresser-Rand, a plant tour, lunch, and a recognition program for the students and teachers.**

The Project Partners:

Dresser-Rand Company
Southern Tier Central Tech-Prep Consortium
VATEA
Six Tech-Prep High Schools

For Further Information Contact: Kris Reuland – Elmira Free Academy
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TITLE OF PRACTICE: High School-College Collaboration for Internships
CONSORTIUM: College of Staten Island

The successful Tech-Prep Program, a collaborative effort by the College of Staten Island, Curtis High School, and Tottenville High School, has enhanced the two-year high school curriculum by providing internships for our students. We have formed a Tech-Prep Advisory Board, consisting of the staffs of the College of Staten Island, Curtis High School and Tottenville High School and representatives of local business organizations. These internships developed as part of the educational training we offered our twelfth grade Tech-Prep students. This experience provides an opportunity for students to use what they have learned by participating in internships at local hospitals, nursing homes, and the College of Staten Island laboratories. Offering these internships in work areas related to medical technology serves to reinforce what we teach by demonstrating to our students that these skills and activities are relevant and vital. Funding for the internships is provided by Training Opportunity Program (TOP).

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TITLE: Making It Happen! Introducing Students To The Workplace
CONSORTIUM: Nassau County Tech-Prep Consortium

Teachers, administrators, and business personnel have recently come to recognize that those students who are exposed to the "real world" via the workplace, tend to become more motivated, focused, and self-aware as a result of their experiences. Providing such opportunities and helping students to make the connections between the classroom and the workplace (while at the same time accommodating the needs of the academic high school) create special challenges.

To date, cooperative business partnerships have been established with two large community hospitals to provide on-site shadowing experiences for junior students enrolled in the Tech-Prep Introduction to Health Occupations Core. In addition, plans are under way to develop agreements to allow students to continue in paid and/or volunteer positions while in the second year of the program.

In order to set up this type of agreement, the first step is to contact the facility and present the school's proposal. Next, contracts and insurance issues must be worked out to the satisfaction of both sides. Then parents of students enrolled in the program need to be contacted for permission to allow their children to attend these off-campus activities. Once the necessary forms and permission have been obtained, a rotation schedule can be created, allowing each participant the opportunity to visit each of the participating hospital departments at least once. Additionally, each student should be provided with a clinical observation record to fill out at the completion of the experience.

It is essential that the teacher conducting classes allow students to discuss their clinical facility experiences. Weekly sessions should be planned so that students can identify connections between their classroom learning and these valuable workplace experiences. Evaluation of the program should be ongoing, and include input from students, faculty, and institution personnel. Participants should plan meetings to allow for biannual review of the program, its goals and objectives.

For Further Information Contact: Professor Mary Stedman -- SUNY Coll of Tech -- Farmingdale
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BEST PRACTICES IN TECH-PREP

TITLE OF PRACTICE: Massena Tech-Prep/School-To-Work Partnership
CONSORTIUM: Tech-Prep in Northern New York

The Massena Central High School Tech-Prep partnership is a new School-To-Work initiative. This pilot program began in the Fall of 1995, and involved 17 junior-level students in a program of school-based learning, work-based learning, and the specific connecting activities that link school, post-secondary education, and work. The curriculum is applied knowledge and combines English, math, and business in concentrated learning blocks.

The project is an eight-way learning consortium between a rural school district in Northern New York, two post-secondary institutions, and five businesses. The industries are ALCOA, Massena Operations, Reynolds Metals, General Motors PowerTrain, St. Lawrence Gas, and the New York State Power Authority. They provided case studies utilizing real industrial problems, plant tours for students, and financial support. The colleges, Clarkson University School of Business and the State University of New York at Canton, provided mentoring, tutoring, networking, exploration of post-secondary studies, and connecting activities with the business partners. The goal of the project is to guarantee that all students at Massena Central graduate with the skills necessary to get a good job and keep it, whether or not they go on to college after graduation.

In the first year, the initial group of 17 students learned how to (1) work in teams, (2) communicate with each other and with their teachers/mentors, (3) work analytically to extract practical solutions from presenting data, (4) concentrate results of those studies into readable reports, and (5) integrate all of it into the solution of real-world problems. Through use of computer technology, students were able to move through word processing to public presentations using Power Point.

In 1996-97, the senior group has moved out of the classroom and into businesses for hands-on learning through shadowing, internships, and apprenticeships, helped by volunteers from the business community. The New York State Department of Labor will help in job preparation by providing students with current labor market information and job-seeking skills.

The students' rigorous classroom learning continues as well. Applied learning in all three academic subjects continues to be integrated with the "real-world" situations they are experiencing outside of school. At the same time, an additional section of juniors plus one more teacher-team have begun the Tech-Prep program, adding 35 more students to this program. Other community businesses have volunteered their resources and technical assistance as well, and all classroom computers have been networked to the businesses and post-secondary institutions. Internet has become a critical learning tool.

Massena, New York's pilot Tech-Prep/STW program is a vital step forward toward integrating community resources with schools in order to improve the way students learn. Students are learning from business, industry and the colleges just what skills are expected, how to succeed by working closely with the other partners, and how to change patterns that are no longer helpful in their life's journey, whether that journey takes them right into a job or to college first.

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TITLE OF PRACTICE: Reducing The Need For Remediation In College Through Curriculum Development

CONSORTIUM: College of Staten Island

The College of Staten Island, Curtis High School and Tottenville High School are collaborating in the development of a medical technology program. Among our goals are reducing the need for remediation in college and developing curriculum to better serve our students and improve their motivation and views toward school. We formed a Curriculum Development Committee composed of college and high school staff from various academic disciplines. We organized a schedule of semi-monthly brainstorming sessions to develop a new curriculum in Medical Technology to be offered in grades 11 and 12. The Curriculum Committee developed an applied integrated interdisciplinary infusion curriculum. The curriculum incorporates applied academics, including skills development in mathematics, communication, and laboratory experience. Students are taught to use computers to analyze data and prepare laboratory reports.

We have found that over the past three years, our students became more positive about school. This is evidenced by a dramatic increase in attendance rates and a significant improvement in their academic grades, improved across the disciplines. Virtually all of our graduates have gone on to college and have passed the skills assessment tests at CUNY. They were placed directly into two- or four-year programs. Preliminary data suggest that our students are faring well in college.

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BEST PRACTICES IN TECH-PREP

TITLE: School-To-Work Assistance Program At Oneida High School
CONSORTIUM: Tech-Prep of South Central New York

The School to Work Assistance Program (SWAP) is an innovative two-year program to better prepare OHS juniors and seniors for careers in manufacturing, engineering, and skilled trades. The program is designed to introduce students to the concepts and skills needed to understand, work with, and manage the evolving processes of tomorrow's industries.

The SWAP program is a partnership between Oneida High School and local industry. The coordinators are responsible for initiating contact with students who are eligible for the program, local industries, and parents. They are also responsible for interviewing possible work site personnel and will be responsible for overseeing student progress in the setting to help foster a quality experience for the students.

Teachers work with students as mentors for their workforce experience. Weekly sessions between all participants, special projects, field trips, and guest speakers are used to foster student initiative and development of skills, problem solving, and teamwork needed in the work environment. Students are expected to complete 6 hours per week in their workplace setting as well as attending these weekly sessions. The entire program is constructed outside of school hours and is evaluated jointly by faculty and employer. The students who complete all requirements established by the faculty coordinator and employer will be granted one school credit. The potential exists for students to be selected as paid summer interns with the employer.

Everyone is the recipient of the benefits of the SWAP program. Students gain knowledge, skills, and job experience; their academics are grounded in practical applications; and they maintain connections with area business leaders. Teachers in the Tech Prep program gain new insights into the demands of the modern work place; they establish valuable connections for future use; and they are better able to assist students in other classes looking toward future careers. Employers gain contacts with promising students; they help to create a vehicle to develop better trained employees; and they make closer ties with the schools for positive input into curriculum development. Truly this is a Win-Win-Win opportunity.

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